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# A Comparative Analysis of Existing Management Systems Utilized in Budget Control and Resource Allocation in Higher Education

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To the Graduate Council:

I am submitting herewith a dissertation written by Betty Ann Hardison Cox entitled "A Comparative Analysis of Existing Management Systems Utilized in Budget Control and Resource Allocation in Higher Education." I have examined the final electronic copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Education, with a major in Educational Administration and Supervision.

C. Kenneth Tanner, Major Professor

We have read this dissertation and recommend its acceptance:

Howard F. Aldmon, H. Alan Lasater, Francis M. Trusty

Accepted for the Council:

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Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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Accepted for the Council

L. Evans Reed

Vice Chancellor
Graduate Studies and Research

# A COMPARATIVE ANALYSIS OF EXISTING MANAGEMENT SYSTEMS UTILIZED IN BUDGET CONTROL AND RESOURCE ALLOCATION IN HIGHER EDUCATION

A Dissertation

Presented for the

Doctor of Education

Degree

The University of Tennessee, Knoxville

Betty Ann Cox

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## DEDICATION

This dissertation is dedicated to various family members--my husband, Stanley Cox; my daughters, Stephanie and Allison Cox; my parents, Lillian and Wallace Hardison; and my mother-in-law, Irene Cox. Without the continued assistance, support, and patience of these individuals, this project would never have realized completion. It is my hope that this tribute may serve to repay the unselfish acts and love which were endlessly shown me.

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ABSTRACT

Due to effects of current inflation, university administrators have been forced to cope with increased costs and decreased earnings. Those responsible for budget control and resource allocation have tried to administer their finances with respect to fiscal dilemmas and yet preserve the quality of higher education. In order to accomplish this objective, various types of management systems adapted to practical financial planning and budgetary techniques have been utilized by universities. This study was conducted to determine the types of management approaches employed by institutions of higher education.

Specifically, the purposes of this study were: (1) to identify existing management systems used in budget control and resource allocation; (2) to assess the effectiveness of the management systems identified by administrators in charge of business and finance within selected public, four-year universities in the United States; and (3) to suggest guidelines for establishing qualified resource and budgetary management systems.

Questionnaires were mailed to a randomly selected sample of 216 university administrators of business and finance. A 45.8 percent response rate was obtained. The

returned instruments were grouped according to administrators who identified use of a financial management system and those who designated none. The former category contained 92.9 percent while only 4 percent maintained that no approach for budget control and resource allocation existed.

An analysis of the data collected indicated that numerous financial management systems were being employed by universities. The mean effectiveness ratings for each method indicated that financial administrators generally perceived their system to be moderately successful. Performance budgeting was the most successful while formula budgeting was seen as least successful. Incremental budgeting represented the methodology most often practiced. Data were provided which indicated financial administrators needed to improve budgetary and resource allocation systems.

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# CHAPTER I

## BACKGROUND OF THE STUDY

### I. INTRODUCTION

The effects of current inflation are being realized by college and university administrators. Particularly the chief executive in charge of fiscal resources has been forced to understand the implications of increased costs and decreased earnings. Although various methods of alleviating the strife have been attempted, many institutions have had to cut spending and alter priorities. Administrators responsible for budget appropriations and resource allocation have attempted to administer their budgets with respect to today's financial needs and yet preserve the quality of higher education. In order to attain this balance, management systems adapted to financial planning and budgetary techniques have been used by universities.

Numerous reasons have contributed to the financial dilemma necessitating the development of a system for handling resources and controlling budgets. Colleges and universities have had to withdraw enormous sums from endowment in order to fund present operations. As a consequence, the remaining amounts from which further

withdrawals could be made have been lessened. Such economic pressures have led to faculty reductions, budget cuts for scholarships and fellowships along with rising charges and a general state of financial exigency. Institutions have ben threatened to the extent that they have had to drastically reduce expenditures, actively compete to maintain or increase enrollments, and eliminate effective programs (Bowen, 1975, p. 150).

Due to the decline of state revenues, public colleges and universities have been granted no immunity from these conditions. Some states have curtailed yearly appropriations in mid-year and see no relief for upcoming years. Further reduction in revenue is indicated and experts predict education will become even more expensive. One basis for such a prediction is the specialized price indices. The Higher Education Price Index (HEPI) developed by D. Kent Halstead showed that prices in general rose approximately 50 percent from 1965 to 1975 while the cost of higher education increased over 75 percent during the same period (p. 151).

With deficits being expected in later periods, institutions of higher education will be forced to balance the unequal financial state and yet maintain quality programs and qualified personnel. According to Elfner:

> Any organization has the responsibility to use its resources efficiently and effectively, especially those which use public tax dollars for a large proportion of its expenditures (Elfner, 1976, p. 4).

Controlling the money resource will remain a constant concern of university financial executives as this particular function influences how the organization grows or changes.

One primary source of help which may provide the greatest long-range benefit is the development and implementation of management systems in the business and financial realm (Shoemaker, 1973, p. 3). By establishing a management procedure which has proven effective, a more efficient use of resources will be facilitated. In a report which emphasized educational finance, it was maintained that colleges and universities are increasingly initiating various types of such systems for financial management (SMU Institute of Technology, 1973, p. 2). Administrators who are given the responsibility of budget control and allocation of resources must use these existing techniques or formulate new practices. In this manner, institutional objectives may be realized while the best method for determining how to regulate funds is defined.

The issue of devising financial management systems is multifaceted and allows administrators to place emphasis

on different aspects according to administrative perceptions (Jedamus, Peterson and Associates, 1980, p. 327). Depending upon the organizational environment, numerous factors inherent in a system's structure will mandate its success. Such elements include which individuals will actually develop the tool, the manner in which any improvement may be noted, the breakdown for analysis of program and departmental funding requirements, channels allowing for internal and external communication, and reporting and data gathering procedures (Rodgers and Rhodes, 1978, p. 36). Those executives in charge of budget control and resource allocation must take not only these characteristics into account but also note costs and difficulties associated with implementation of any approach. Through analysis of these techniques and with careful development the educational enterprise will be able to distribute its fiscal resources in an attempt to maintain a viable position.

The adoption of any management system for fiscal purposes will require total financial planning. This total planning has been defined as ". . . the advance programming of all plans of financial management and the integration and coordination of these plans with the operating plans of the enterprise." This necessarily involves a two-fold approach: first, determining financial resources required to meet the organization's operating expenses and second,

forecasting the amount of appropriations in existence while developing the most effective management system for governing the allocation and use of funds (Cohen, 1966, p. 5).

A. C. Eurich, president of the Academy for Educational Development, Incorporated, has further stressed this same principle--the only manner in which education is to survive is through the use of good planning. Long-range planning of setting manageable goals is the primary means of success. Eurich's findings include a recognition of the most critical problems facing today's colleges and universities. These include vague, poorly defined objectives, inefficient and outdated teaching techniques, disagreement about top priorities, inefficient use of facilities, and a lack of quality faculty and administrators (Eurich, 1970, pp. 18-22). This concept is further emphasized by management consultant Keane who stresses that higher education will experience increased pressure to make better use of resources through improved management and administrative techniques (Lahti, 1973, p. 3).

George Weathersby viewed the managing of finances and allocation of an organization's scarce resources as the essence of its activities and the embodiment of its values and goals. According to this authority:

> The actual compiling and controlling of budgets is often an autocratic, administrative task which does not explicitly or formally address the problems, objectives, or goals of an institution. . . . As a consequence, explicit values are rarely communicated between planners and managers, resource budgeting tends to be centralized or at least the flow of information is one way, and outputs are frequently redefined every time a department chairman or a dean wants something new (Weathersby, 1970, p. 3).

It is held, therefore, that higher education institutions must develop management systems in terms of established institutional priorities in order to facilitate organizational growth.

Because of the individual nature of colleges and universities, management systems for budget control and resource allocation will need to be studied before being put into practice. Once accepted these techniques for appropriating funds will allow for the development of programs to meet new educational challenges. Higher education administrators will commit themselves and their organizations to systems which will improve and effectively measure the quality of services while fully employing all available resources.

## II. PROBLEM STATEMENT AND PURPOSE OF THE STUDY

With increased costs and need for accountability in higher education, university financial administrators in charge of budget control and resource allocation need to

recognize that various management systems are being utilized. Individuals charged with the financial responsibilities of institutions must become aware of specific systems in current use and whether particular techniques are rendering successful outcomes. With such information, selections between alternative systems such as program planning and budget system, zero-base budgeting, formula budgeting, etc., may be accomplished with respect to characteristics inherent in the process and organizational goals.

The present study attempted to identify existing management systems utilized in budget control and resource allocation and assess their perceived effectiveness as expressed by administrators in charge of business and finance within selected public, four-year universities in the United States. Another purpose included in this study was that of suggesting guidelines to establish qualified resource and budgetary management systems for institutions based on accumulated data about present financial procedures in use. In addition, the study analyzed the reasons provided by those administrators who employed no management system for budgeting and resource allocation.

## III. SIGNIFICANCE OF THE STUDY

Available data concerning the future of higher education institutions suggests that administrative management procedures will need to be carefully analyzed and designed in order to accept unique challenges and provide direction for the academic community (Temple, 1973, pp. 98-100). As more practical methods of financial management are being developed and since university administrators are determined to protect academic goals from the encroachment of budgetary restraint, it will be of assistance to financial administrators involved in the budgetary and resource allocation process to recognize what systems are being used in other institutions to achieve similar purposes.

Although substantial literature concerning different types of management systems for budgetary purposes is available, this material alone does not provide sufficient data to accurately describe the most effective methods currently in use by colleges and universities. If measures are to be acquired which will achieve better control of funds and allocation of resources in higher education, some measure of each management technique's effectiveness is imperative. This study concentrated on determining effective management systems currently in use

in institutions of higher education. The study focused on the financial and business departments regarding their success in effecting quality and efficiency in conjunction with the changing concepts of accountability. In this regard, data were gathered which contributed to the development of a more practical and systematic means of handling funds.

## IV. ASSUMPTIONS OF THE STUDY

The following assumptions were recognized for the purposes of this study:

1. The present economic status and future implications for financing higher education institutions mandated the need to analyze financial management systems and their subsequent effectiveness.

2. Continued rising costs of institutional operations reflected the necessity for developing more precise funding and budgeting procedures.

3. Selected institutions involved in this study provided relevant data to the researcher.

4. Individuals responding to the questionnaire provided the required information.

5. Results of the questionnaire described the actual management systems which departments of business and

finance are currently employing as well as their perceived effectiveness.

## V. CONSTRAINTS OF THE STUDY

This study was delimited to the 50 states within the United States. It dealt only with management systems used presently in departments of business and finance by a random sample of four-year, public institutions. Specialized, graduate, and professional schools were excluded from the population. The data used in developing this study were delimited to the responses on questionnaires received from financial administrators in the selected institutions. The search for related literature was restricted to books, abstracts, and periodicals on file in The University of Tennessee library system, microfiche on file in the Educational Resources Information Center, and materials obtained by the researcher.

## VI. DESIGN OF THE STUDY

The initial undertaking of this study consisted of a review of related literature. Based on selected data from this material, a questionnaire was designed to allow university administrators in charge of formulating and operating financial management systems to convey the type

of budgetary and resource management approach currently in use. These participants were also asked to express their perceptions as to the degree of effectiveness manifested by the practice. Questions were designed to indicate those officials whose institutions maintained no recognizable management system. In order to examine the validity of the instrument, a field test was conducted. The revised questionnaire was then mailed to appropriate business and financial executives included in a random sample of 216 four-year, public higher education institutions in the United States. Follow-up requests were forwarded to those officials who had not responded to the information within two weeks. After all available data were gathered, the various financial management systems were categorized. The information then was coded for computer processing so as to identify those methods which had resulted in maximum effectiveness. At this point, specific suggestions were devised for future implementation of financial management systems in similar universities.

## VII. QUESTIONS RELEVANT TO THE STUDY

The study focused on the following questions concerning management systems for budgetary control and resource allocation and the development of such methods in higher education institutions:

1. What management systems are currently used by institutions of higher education for budget control and resource allocation?

2. Who is primarily responsible for developing such a managing tool within the financial realm of the institution?

3. Does this procedure provide continued improvement in resource and budgetary management?

4. Have financial needs been analyzed for each department and academic program?

5. Are procedures established within the management system for coordinating adequate communication between the financial department, other internal elements within the institution, and external agencies?

6. Does this system utilize a reporting procedure which provides administrators involved in the financial field the necessary data for making decisions?

7. Were any procedures in the system designed to determine the degree of effectiveness for the management system used?

8. Was the financial management system effective in budgetary control and resource allocation?

9. Was there a relationship between size of institution and level of involvement?

10. Was the initial cost of implementing the management system justifiable with respect to improved effectiveness?

11. What were the difficulties in the management of financial resources?

## VIII. DEFINITION OF TERMS

For the purpose of this study, the following terms were defined:

Autocratic. An atmosphere characterized by a high degree of authority vested in the central administration and one which allows little opportunity for participation by other members of the organization.

Democratic. An atmosphere in which all policies and decisions are a result of group participation and shared decision making.

Effectiveness. The realization of anticipated goals and objectives.

Efficiency. A minimal use of resources in a given activity or program (Shoemaker, 1973, p. 29).

Financial management. Various activities within a university's business and finance department designed to perform the functions of budgetary control and resource allocation.

Laissez-faire. An atmosphere characterized by competitive pursuit involving all members of the organization as noninterference prevails.

Management. Taking specific actions to realize planned objectives.

Management system. Those endeavors whose purpose is to direct and regulate objectives and activities of a university or a separate unit within the institution.

Objective. Specific statements of behavior to be displayed by individuals and to be evaluated at a particular time.

Outcome measure. A quantifiable measurement of the impact of an educational institution or one of its departments.

Performance. Actions of an individual or group of persons after being assigned a particular activity.

Resource allocation. Distributing fiscal resources within an institution so as to achieve a particular mission, goal, or objective.

Systems approach. A logical, rational procedure for designing a progression of interrelated components planned to function as a whole in achieving a predetermined objective (Harvey, 1976, p. 7).

Team approach. An atmosphere characterized by a combined group effort to achieve organizational goals.

## IX. ORGANIZATION OF THE STUDY

Five chapters are contained in this study. The first chapter includes an introduction, a statement of the problem, the purpose of the study, the significance of the study, the assumptions, the constraints of the study, procedures of the study, questions relevant to the study, and definition of related terms.

Chapter II contains a review of related literature including a history of financial management systems, factors considered in developing financial management systems, characteristics of the more noteworthy financial management systems in use, and the costs and difficulties associated with financial management systems.

Chapter III is comprised of the methodology and procedures used for implementation of the study including the questionnaire design, field testing of the instrument, selection of the sample, distribution of the questionnaire, treatment of the data, and other methods utilized in the data collection.

Chapter IV contains the presentation, analysis, and interpretation of the data.

Chapter V provides the summary, conclusions, and recommendations of the study.

# CHAPTER II

## REVIEW OF RELATED LITERATURE

### I. INTRODUCTION

University budgeting and resource allocation comprise the surest indications as to what commitments have been made by an institution. The literature associated with these financial aspects showed that different management systems have historically been utilized to complete the processes. Problems inherent in these functions have necessitated use of a wide variety of techniques. Although financial leadership may have existed within institutional systems, one difficulty has been determining university obligations. An additional problem is that not all funds have been claimed as budgeted sources and not all resources have been specifically dealt with in the budgeting process.

It is readily apparent from studying information pertaining to budgeting methodologies in higher education that such concerns are not new. As early as 1932 the National Committee on Standard Reports for Institutions of Higher Education issued a bulletin entitled A Study of Methods Used in Unit-Cost Studies in Higher Education. The American Council on Education furthered the work of the

committee in 1952 and 1955 with the two-volume College and University Business Administration. Beardsley Ruml in the 1950s argued that adequate planning and management could assist universities in achieving more effective utilization of personnel, space, and financial resources. He advocated budgetary control systems as a means for managing since this would make it possible to set priorities and maintain control over resources.

During this same time and with more recent emphasis, the strongest impetus for studies associated with financial aspects of higher education has been federal concern over the problems related to the huge amounts of federal research funds flowing into educational institutions. Such continued interest in fiscal affairs has prompted the establishment of related organizations including the National Center for Higher Education Management Systems which originated at the Western Interstate Commission for Higher Education.

Due to the increasingly complex nature of university financial operations and with additional pressures for administrators to make more informed decisions, studies have been completed which focus on the specific type of management procedure utilized. These studies offered insight into institutional strategies for planning budgets and allocating resources. From data

obtained by these sources, the most prominent systems employed were noted.

In 1973, for instance, the Exxon Education Foundation designed a program of grants called the Resource Allocation and Management Program (RAMP) in an attempt to promote wider use of management improvement techniques. Although this specific program was limited to private liberal arts colleges and universities, the participating institutions submitted strategies to improve their management practices which have been applied to other universities. In noting the relevancy to devise adequate financial management systems, the proposal request made by Exxon must be emphasized:

> Generally speaking, the management practices implemented should be designed to remove the crisis and opportunistic elements from the ways in which decisions are made. While the needs of individual colleges will differ, we assume that modernizing management practices will usually include (1) a clear redefinition of authority and responsibility within the institution, (2) a definition of the objectives of the institution and its constituent units, (3) a system of continuous comparison of achievements to objectives, (4) a system requiring a review of all possible options before any decision is made, and (5) a management information system capable of projecting the financial, personnel, and physical space allocation consequences of each option being reviewed (Baldridge and Tierney, 1979, p. 2).

Overall assessments of specific management approaches were formed from data obtained in the Exxon study and served to reveal strengths and weaknesses inherent in particular institutions. As an example, one conclusion derived was that management information systems and management by

objectives programs were worth their cost of implementation. Thus, as early as 1973 approaches were devised to determine which particular management systems were adequate for higher education (p. 13).

As its name implies, the National Center for Higher Education Management Systems (NCHEMS) is concerned with developing management systems for institutions of post-secondary education. Since its inception in 1965, it has recognized that both outcome and financial information are necessary for effective planning and management in colleges and universities (Rodgers and Rhodes, 1978, p. 2). Subsequently, in 1978 NCHEMS sponsored a study to examine how certain planning and management tasks were performed at a sample of 126 institutions with respect to 5 products developed by the organization. Even though this project dealt only with systems designed by NCHEMS, it included the specific management tasks of budget control and resource allocation within public, four-year universities. As a result, NCHEMS developed a structure for the application of MIS to higher education and generated data which systematized models and taxonomies for categorizing budget and resource items (Shoemaker, 1973, p. 59).

Numerous sources were found in the literature which advocated specific financial planning approaches in higher education. During the last decade, modern management

systems known by such acronyms as PPBS, ZBB, ETOB, and SWGG have become entwined in the financial realms of higher education institutions. Information pertaining to these and other approaches was replete throughout the research. Data intensified during recent times as university administrators realized that they would not be able to escape the impact of modern management approaches to budget control and resource allocation with increased accountability pressures. As responsibility has grown for getting the maximum utilization and benefits from available finances, authorities have felt the need to offer suggestions for meeting these inadequacies. Reviewed literature showed disagreement as to which specific financial management system would produce the greatest benefit to universities. There was agreement, however, that the need to establish techniques for managing finances accelerates with the uncertain fiscal future confronting higher education institutions.

## II. FACTORS IN DEVELOPING FINANCIAL MANAGEMENT SYSTEMS

Management systems involved with budget control and resource allocation are not uniform among universities. Some institutions use specific procedures in published projections or fiscal plans while some do not follow any

certain process (Balderston, 1974, p. 201). In order for an institution to develop a functional methodology, essential factors pertaining to financial aspects must be taken into consideration. Not only must administrators recognize the elements of budget control and resource allocation but they must also be familiar with which systems may successfully adapt to their particular needs.

University administrators must first develop a concept of budget control which will serve to foster an effective management system. Although budget control is often regarded as a dull and tedious task, it is one of the most dynamic functions of management. According to Orwig and Caruthers, the essential purposes of this function are ". . . to distribute resources, translate plans into action, and foster accountability" (Jedamus, Peterson and Associates, 1980, p. 341). The budget, hence, acts as an instrument that enables the allocation of resources from one organizational unit to another whether it be from a department to a faculty member, an institution to a department, or a funder to the institution. By utilizing a management system in this process, explicit choices may be made from among alternative ways in which the resources might be used.

Another factor to be considered in formulating a concept of budget control is the difference between

planning and budgeting. Even though there is a relationship between these two activities, they also consist of unique characteristics. Planning is basically concerned with desired outputs while budgeting and budget control focus on needed inputs. Mosher observed that planning and budgeting frequently require different perspectives; the former is forward looking and opportunistic as the other is conservative and control oriented. He further noted that " . . . budgeting and planning are apposite, if not opposite. In extreme form, the one means saving; the other, spending" (Mosher, 1954, p. 48). Despite these differences in perspective, there generally is an expressed need to integrate planning and budgeting more closely. Such a belief must be realized in the development of a management system for if the budget is to be a tool for institutional development, it should be based on planning decisions.

The specifics of resource allocation must additionally be identified by the university administrator as the necessary latter component of any financial procedure. While managers plan for the future in many ways, the allocation of resources largely determines how an organization grows and changes. This function involves distributing resources in order to achieve the mission, goal, and objectives of the institution. Since the

resources which come to an enterprise are finite and often severely limited, efficient allocation demands thoughtful and careful planning (Brown and Reeves, 1978, p. 50). Thus, the establishment of a systematic method of managing the task becomes necessary.

The activity of resource allocation may be accomplished through a variety of processes. Rogers and Van Horn noted that in a highly centralized allocation procedure the president unilaterally may set allocations for units or even for individuals. Centralized systems, hence, typically involve a bargaining process in which the deans or department heads negotiate with the chief administrator for their allotment from the central sources of income. In a highly decentralized system, on the other hand, each faculty member might keep the income he generates and pay an overhead charge for services received from the university. This income, in turn, may be used by the unit to pay its own direct operating expenses and to purchase services from other areas of the university (Rogers and Van Horn, 1976, p. 2). Administrators must recognize the centralized and decentralized aspects in management systems and analyze the benefits before accepting any specific approach.

Once the concepts of budget control and resource allocation have been firmly established, additional factors

unique to the institutional setting must be discerned. Recognizing that financial management consists of a process by which administrators combine scarce resources to achieve given ends gives rise to the fact that the efforts and interactions of human beings are involved. The designated system will involve individuals seeking to control and influence the actions of other persons existing in a particular physical environment. A constraining element to acknowledge becomes that of what type of objectives, persons, and setting will be mandated by this method (McFarland, 1964, p. 11). Different systems will necessarily adapt more easily to definite groupings.

It is of critical importance to determine which individual within the university will accept responsibility for the development of a financial management system. Although most often this duty is assigned to the president or administrator in charge of business and finance, it frequently must be completed by a combination of persons including faculty members, board members, and even students. Those delegated with this task must be knowledgeable in the matter of budget control and resource allocation with respect to their institution. According to Heneman, it is imperative that the designated individuals be aware of such compelling factors as whether the money, people, and plant are being fully and effectively used;

where to turn for additional funds in cases of deficit operations; specific requests made of alumni, corporate and general foundations, and other donors; appropriations made by state legislatures; the amount of funds accepted from the federal government; and revenue obtained from tuition charges (Keezer, 1959, p. 121).

Authorities in the field of financial management maintained that the principle of long-range planning must be considered before accepting any management procedure. Ingrained in this belief is the necessity of providing for continued improvement through budget control and resource allocation. Various described procedures allow for a determination of demonstrated change and/or improvement in the overall management of university finances while others concentrate solely on annual short-term objectives. A report prepared by the Institute of Technology at Southern Methodist University concluded that in order for a financial management system to be effective, the overall result must be a systematic and rational process for university decision making and long-term planning (SMU Institute of Technology, 1973, p. 2). In advocating the use of program budgeting, a specific management approach to budget control, Terrey furthered this theory:

> . . . The system must be able to generate the data which are needed to support the structural format and the analytical process. In addition, the system should

> provide data for progress reporting and control so as to indicate how good or how poorly major program decisions are being carried out in the process of implementation. Likewise, the system must provide data to serve as a basis for analytical processes in making estimates of benefits and costs for future alternative courses of action (Terrey, 1968, p. 15).

Methods for evaluating the effectiveness of any management system demand detailed study as well before any final commitment is determined. This necessitates the examination of reporting procedures which provide decision makers with relevant data to make judgments and properly assess the total circumstances. Opportunity for study and feedback may be given for each department and/or for each academic program. Information in the related literature suggested that evidence for ascertaining effectiveness of the method must be available to some degree in order to be adequate. Included in all of the NCHEMS management products are the assumptions that:

> Improvement may be gained through the use of structural frameworks for information gathering and analysis;
> Improvement may be gained through better and more consistent information and analysis;
> Improvement may be gained by the sharing of consistent information brought about by structural mechanisms;
> More quantitative information leads to better decision making (Rodgers and Rhodes, 1978, p. 97).

As stated by this same authority, the management process must consist of ". . . reporting, analysis, and evaluation" (p. 35). This specifically includes:

> . . . Conducting the audit function based upon data derived from the institution or sources external to the institution; analytical tools and techniques, as well as professional opinions, values, and other influences to assess the performance (both effectiveness and efficiency) of the system (p. 36).

Since the establishment of financial management systems involves a process consisting of human elements, attention must be devoted to the type of communication allowed. Depending upon the particular institution, interaction will be required between the financial sector and other areas both within the institution and externally. Administrators must determine the amount of communication desired with respect to involvement by different constituencies. A financial approach conducive to these perceptions may then be selected. Furthermore, a more important function may be served through the avenues of communication--that of acting as an instrument to achieve institutional accountability both internally and to the public sector. Caruthers and Orwig in a report on budgeting in higher education concluded that communicating the financial methods of the university will internally provide a mechanism for expenditure and management control of operational activities. Externally, this action helps to convey the activities that will be supported by allocations and the expected results (Caruthers and Orwig, 1979, p. 2).

# III. CURRENT MANAGEMENT SYSTEMS UTILIZED IN BUDGET CONTROL AND RESOURCE ALLOCATION

No single approach to budget control and resource allocation was identified in the literature. Instead there existed numerous management systems designed to fulfill these financial functions. Although no particular system has currently been shown to resolve the complexity and conflict inherent in the forces acting on higher education, varied techniques were provided with special attention throughout the material. Caruthers and Orwig clarified the diversity of these methodologies:

> The several approaches used in postsecondary education for budgeting have been categorized in various ways. Robins identifies line-item budgets, program budgets, incremental budgets, zero-base budgets, and formula-based budgets. The 1973 Annual Report of the SMU Institute of Technology identifies such approaches as: "every tub on its own bottom;" the "king's decree;" the "squeaky wheel gets the grease;" the formula; the planning, programming, and budgeting system; and zero-base budgeting. Bacchetti adds convergence budgeting to this same list of techniques. Adams, Hankins, and Schroeder discuss "innovative" budgeting techniques, such as cost-income budgeting, internal pricing, and program budgeting, in addition to considering the more traditional incrementation of the previous-object or line-item budget. We find that incremental budgeting; formula budgeting; planning, programming, and budget systems; zero-base budgeting; and performance budgeting are representative of the most frequently discussed and practiced methods today (Caruthers and Orwig, 1979, p. 35).

The most noteworthy of these procedures include similarities as well as unique characteristics and are briefly described in this section.

A traditional and one of the oldest systems utilized in financial management is that of incremental budgeting. Described in the literature as early as 1922, it represents a type of budgetary analysis and management strategy (p. 36). The basic philosophy underlying this system is that the current budget is generally distributed appropriately among both the functions and objects of expenditures and that minor programmatic change is needed. In incremental budgeting, every line item is either considered for an increment or remains unaltered in the base. Increments are often calculated as standard percentage adjustments for every line item or group of line items. This system is becoming increasingly popular as resources continue to decrease. Richard Heydinger asserted this fact when noting that

> . . . Many institutions have initiated a budgetary process of "retrenchment and reallocation." Monies are taken away (retrenched) from academic programs to create a fund that is divided (reallocated) among deserving programs (Jedamus, Peterson and Associates, 1980, p. 310).

Through incremental budgeting, decisions are made on which programs will be furthered and which will be eliminated.

Incremental budgeting allows for high faculty involvement as each program participant must determine which items to retrench. Program development also remains

with the faculty which must devise suggestions for reallocation. Criticism from participants is common since this system starts with monetary amounts instead of purposes and activities of the organization as the beginning point. It is considered largely as a financial function creating few demands for management yet is also found to require the least work and analysis. Little conflict arises with the use of this approach since most individuals involved assume that each unit will receive at least as much the next year for expenses as they obtained for the current period (Caruthers and Orwig, 1979, P. 38).

Incremental budgeting systems vary significantly in their management practices. The "Squeaky Wheel Gets the Grease" (SWGG) approach depends almost totally on campus politics. Usually found in institutions lacking in systematic financial managing, it promotes an attack on the annual revenue pool by the head of each budgetary unit with the aim of securing the maximum portion for his unit. It was contended in a report focusing on budgeting and educational finance that this causes budgetary allocation to be resolved primarily by ". . . bureaucratic infighting, politicking, extravagant claims, misleading statistics, and all the other tools of the squeaky wheel." This results in a system which is politically based instead of a goal-oriented financial plan (SMU Institute of Technology, 1973,

p. 5). Any progress, hence, will tend to be dependent upon the ability of different academicians to persuade the administration to allocate a disproportionate share of revenue to their divisions.

The "King's Decree" (KING) approach is another type of incremental budgeting procedure. It is a relatively closed process as the total revenue pool is determined by the central administration. With or without additional consultation, the central executives decide the amount of funds to be allocated to each of the institutional divisions. An SMU Institute of Technology report concluded that

> . . . This is a completely authoritarian system whose effectiveness depends in large measure upon the accuracy of the information presented to the decision maker by the supporting staff and organizational heads prior to the time the allocations are made (p. 4).

An advantage to this method is that all resources are allocated to defined and consistent objectives desired by the total institution, at least as far as the central administration perceives them. An apparent weakness, thus, is the real ability of the King to accurately assess the needs for resources in a manner which will achieve the objectives of an enterprise as complex as a university. Due to the intricate governance and tenure systems in most present universities this practice is not widely accepted.

Characteristics relative to incremental budgeting are found as well in the "Every Tub On Its Own Bottom" (ETOB) procedure. This approach allows for clearly recognized expenditure and revenue units and mandates that each such division generate sufficient revenue to offset its expenditures. Since revenue expectations are carried on below the central administration level, it is often considered an attractive arrangement. It maintains, however, numerous pitfalls as well. Those units which experience an increase in revenue will extend their activities subsequently. The opposite situation will generally not occur since those divisions facing a reduction in revenue will not correspondingly decrease their expenditures. This situation is fully explored by an SMU report:

> The particular tub is not supported fully by its own bottom and is in a deficit position through inability, or unwillingness, to respond to changed circumstances. The overall university thereby ends up in a deficit position whenever any one of its tubs fails to be supported on its own bottom. In the absence of large, uncommitted endowment funds, the university does not have the ability to adjust to the problem (p. 3).

Formula budgeting, although most often considered to be of interest to state-level educators, is becoming more frequently discussed in higher education institutions. This approach allocates available funds to various operating divisions with respect to an established unit of

production, i.e., the student credit hour. In turn, the student credit hour is weighted according to level--undergraduate, graduate, and doctoral. Other quantitative factors utilized include full-time equivalent students and head count.

Resource allocation is especially enhanced with the use of formula budgeting. This system ". . . translates the inputs to the resources required--for example, translating enrollment changes into changes in demand for courses, faculty, facilities, support functions, and so on" (p. 5). An advantage of formulas is due to the fact that administrators are provided with a more systematic process of determining what units deserve funding as a result of actual production. It is difficult to determine how widely formula funding is used, however, since there is a lack of a commonly accepted definition.

Caruthers and Orwig found that currently utilized formulas may be classified into three computational methods labeled "workload, base, and staffing pattern" according to the following description:

> In its simplest form, the workload method estimates resource requirements by multiplying the planned level of activity within a function by expected unit costs. The base method first calculates the resource requirements for the base (usually instruction) and then the needs of other budget components are determined as a percentage of that base. The staffing-pattern approach

> estimates salary expenditures only. Using a salary schedule or average-salary target, total salary expenditures are derived after determining the number and type of positions required (Caruthers and Orwig, 1979, p. 42).

Formula budgeting offers varied approaches in its calculation method. Before any application of this type of system, it would be advantageous for the potential user to determine how the formulas treat different levels of instruction--student or course level or both, the manner in which disciplines are recognized, how the fixed and variable nature of costs are handled, whether different types of institutions are recognized, and if the factors are obtained from experience or mere judgments. Such elements are dealt with similarly in formula budgeting systems but also represent unique practices in more specific formula approaches.

Unit budgeting, as a type of formula system, represents a more simplified approach and aids effective communication. Jerry Herman described this method:

> Unit budgeting is merely the act of delegating planning decisions in the construction of a budget, devising an accounting system that delegates monitoring functions to the employee in charge of the defined unit and arriving at an accountability system that holds the employee responsible for the unit budget expenditure under his control (Herman, 1977, p. 38).

Interaction, hence, is facilitated as a result of involving more people in the planning, accounting, and accountability functions. This additional involvement assists

participants in understanding the financial management system while allowing for adjustments within resource allocations to occur more easily.

Equity in allocation of resources is furthered with the more complex function-object budgeting, another prototype of the formula methodology. This system defines functions as activities for which funds are expended while objects are considered services or commodities for which expenditures are made (p. 31). Function accounts for expenditures generally include such divisions as instruction, operation of plant, maintenance, and fixed charges such as retirement program payments. Object accounts, in contrast, are divided into units involving salaries, contracted services, supplies, equipment, and travel expenses. Even though this method provides for comparisons of current budgetary allowances and resource allocations with past years, it is not based on predetermined goals and objectives. Instead, it represents a uniform method of accounting for expended dollars.

Throughout the literature, authorities claimed many similarities between formula budgeting and cost analysis. Miller saw little real difference between these two financial management approaches and believed that the apparent difference is ". . . only a matter of temporal perspective for cost analysis measures the past while formulas estimate the future"

(Caruthers and Orwig, 1979, p. 39). Current studies suggested that the two most noteworthy systems deriving from the cost analysis method include cost-benefit analysis and cost-effectiveness analysis.

Cost-benefit analysis rests on the concept that the benefits of a proposed course of action must be compared with its costs. Upon considering adoption of this financial management system in higher education, Anthony and Dearden proposed two essential points:

> 1. Cost-benefit analysis focuses on those consequences of a proposal which can be estimated in quantitative terms. Since there is no important problem in which all the relevant factors can be reduced to numbers, cost-benefit analysis will never provide the complete answer to any important problem.
> 2. However, if some of the important factors can be reduced to quantitative terms, it is often better to do so than not to do so. The resulting analysis narrows the area within which management judgment is required, even though it does not eliminate the need for judgment (Anthony and Dearden, 1980, pp. 650-651).

Thus, cost-benefit analysis requires that a program not be adopted unless its benefits exceed its costs. It also insists that if participants are forced to choose between competing proposals, the one with the greater benefits over costs or the one with the lower costs if benefits are equal will be preferred.

Cost-effectiveness analysis is often used synonymously with cost-benefit analysis but has special elements which deserve attention. Effectiveness is used

primarily when the anticipated advantages cannot be measured in units similar to those for determining costs. In these instances, a specific level of effectiveness is assumed and the ". . . alternative methods for achieving it are costed to determine the lowest level of resource inputs for the same degree of effectiveness" (Knezevich, 1973, p. 184). Generally this system is concerned with establishing an index that demonstrates the advantages--effectiveness--as compared with the disadvantages--costs--of an optional approach to one or more desired outcomes. It starts by defining purposes and continues by arranging cost data related to outcomes. Analysis is the final step that applies the data in the appraisal of options (p. 185).

Planning, programming, and budgeting system (PPBS) as a financial management tool represents ". . . an integrated system to improve the information base for policy, program, and resource allocation decisions" (Riggs, 1975, p. 7). Although its definition was not standard but enjoyed endless description in the literature, primarily it was accepted to encompass a ". . . unifying and comparing process for higher level review and analysis of program alternatives" (p. 8). Proponents of this system believe that its effectiveness will be most greatly appreciated in higher education institutions. According to Terrey, its particular relevance for universities is apparent:

> All colleges make use of budgets. Many colleges are extensively engaged in planning activities over extended time line horizons. What seems lacking, in a conceptual way, is a merger--an integration--of all these activities into a system conducive to decision making. A system based on PPB requires constant reiteration of the word sequence: planning-programming-budgeting. The budget is a derived factor. It is not a primary document. It is derivative of larger aims and larger objectives. The iteration of the terms in PPB produces a system by which a program budget is based on the idea that analytic questions gain visibility and that economic variables are addressed within an over-all planning context. The over-all planning context, in turn, generates alternative means for achieving on-going goals and objectives. The system should, therefore, explicate for the policy-makers the consequences of considered alternatives. As a result, the budget becomes a derivative of the process (Terrey, 1968, p. 2).

PPBS as a methodology has a primary significance in that it specifies and clarifies the goals and objectives of an organization's programs. An institution is forced to recognize what its programs are intended to do and whether such programs are serving their purposes. In light of current retrenchment necessities in universities this would be of major assistance. Administrators, through utilization of PPBS, would be impelled to ascertain what was actually occurring and allocate resources accordingly.

Characteristics of PPBS are numerous. It is clear from the name of the system that three major steps are involved--planning, programming, and budgeting. Planning not only sets goals and makes policy but also acts as a

long-range process in considering the multi-year implications of current decisions (Riggs, 1975, p. 10). Programming, in contrast, acts as a selection technique in which specific courses of action, known as programs, are chosen. In this phase, mechanisms for review and control are enunciated. These, however, are usually defined within a shorter time frame of 1-5 years. Budgeting, the final step, involves the ". . . translation of planning and programming decisions into specific financial plans in time frames of about one year" (SMU Institute of Technology, 1973, p. 6). The SMU study dealing with educational finance proposed that budgets are specific financial, manpower and policy plans to be implemented during the budget period. It concluded that the budgeting phase analyzes organizational functions and activities necessary to achieve the objectives by various alternatives previously identified (p. 7).

Possessing similar elements to the PPB system but put into prior practice is the financial management approach known as performance budgeting. This system as a concept was identified in the Hoover Commission's report of 1949 (Knezevich, 1973, p. 123). Performance budgeting provides greater attention to the efficient management of the organization. It differs from PPBS in the described manner:

> Performance budgeting is management oriented; its principle thrust is to help administrators to assess the work efficiency of operating units by (1) casting budget categories in functional terms and (2) providing work-cost measurements to facilitate the efficient performance of prescribed activities (p. 124).

Knezevich further noted that performance budgeting is retrospective while PPBS is prospective and looks to the future.

The basic characteristics of performance budgeting involve activity classifications, performance measurements, and performance reports. The performance measurements designed for each activity demonstrate the relation between its inputs and outputs. Performance reports allow for comparisons of actual experiences with budget projections (Caruthers and Orwig, 1979, p. 56). Inherent in these elements are factors which may act as barriers to the adoption of performance budgeting to universities. Initially, it often is difficult to assign a specific performance to a particular organizational division since frequently more than one unit contributes effort. In the same respect, it is a problem to link an outcome to budget amounts and to establish a cause-and-effect relationship. These obstacles to performance budgeting must be recognized and dealt with by higher education administrators in order to facilitate effective financial management.

Literature revealed that the system of zero base budgeting (ZBB) is becoming increasingly popular as a

financial management system in higher education (Kravitz, 1977, p. 38). The underlying concept involved in this approach is that no program deserves funding simply because it received revenue in the past. ZBB is comprised of four basic functions including identifying decision or budget units, analyzing the units to ascertain alternative service levels while establishing decision packages to accompany these alternatives, ranking the decision packages by administrators in charge of finance, and presenting the proposed budget to those who make the final decisions.

Budget control alternatives are prepared by educators other than central administrators when ZBB is practiced. Since the decision unit is the lowest level at which decisions are made, this usually involves departments in the university setting. The next step utilizes the manager of each unit or, in the case of higher education institutions, the heads of the various departments. At this point, an analysis of alternative service levels includes a study of the effects of funding less than the current budget figure. Decision packages prepared subsequently contain a statement of the purposes and objectives of the decision unit, a description of the activities, definitions for workload performance, costs and personnel requirements, and other funding sources (p. 39). Central administrators finally become involved in the ZBB

ranking process as they examine the prepared decision packages and arrange them in order of priority.

Since zero-base budgeting operates on the concept that all expenditures must be justified every year as though they were being requested from the point of zero, this system may be applied to all phases of university operation. Proponents of ZBB based this contention on the following factors:

> ZBB spotlights redundancy and duplication of efforts; it focuses on programs and expectations rather than on percentage increases or decreases from previous years' activities; it establishes priorities within and among responsibility units and allows comparisons to be made across organizational lines so that overall priorities can be established; and it aids performance evaluation by providing a data base which shows whether or not each activity or operation has yielded the benefits and used the costs expected (Dermer, 1977, p. 251).

Less prominent management systems were also shown in the literature to be used in budget control and resource allocation. They did not constitute approaches about which authorities are increasingly producing data to verify their effectiveness in the financial realm. Most of these methodologies are presented by only a few authors and are not dealt with at length by authorities in financial management. As a result, less time will be devoted to these systems. Included in this list are Delphi, PERT, CPM, simulation, and MBO. Data suggested that these

techniques may be used alone or in conjunction with other financial management systems.

Graeme Norris indicated in a study of an effective university that the Delphi technique is a useful management system for the allocation of resources (Norris, 1978, p. 14). He based this contention on the fact that in completing such a financial function

> . . . It is necessary to incorporate subjective judgment which involves indefinite information and opinions on risk. Faced with the need to make value judgments it is necessary to avoid accusations of bias, etc. by using a method that improves the usual committee approach. Delphi is, or can be seen to be, such a method (p. 15).

As a technique, Delphi uses written answers to a series of questionnaires in order to elicit and refine a consensus of opinion. It has been used successfully in higher education in the United States (p. 16).

Program Evaluation and Review Technique (PERT) as well as its companion approach, the Critical Path Method (CPM), have been used in financial management as planning, control, and information systems. When used in this context, they ". . . reflect quickly the interaction between production and distribution operations and such key financial measures as costs, profit, and cash flow" (Koontz and O'Donnell, 1976, p. 690). Through utilization of PERT and CPM, the financial administrator is able to analyze budgetary and resource factors including the effects of

reducing or increasing output in various programs, reduction in demand, and price changes.

PERT is a system of analyzing, planning, diagramming, and managing a project. The project is broken down into small segments and then separated into different activities and programs essential to achieving the overall goal. The information is "networked" and arrow diagrammed (Shoemaker, 1973, p. 38). The diagram shows the sequence and interdependence of activities and indicates the critical elements of a system. When dealing with finances, the events are grouped into work packages for purposes of accumulating costs. Thus, cost accounts are established for each activity or program.

As an outgrowth of PERT, CPM is basically concerned with the minimal time required to complete individual activities and entire projects. Terrey explained that the indication of minimal time allotted specific activities develops priorities which allow for increases or reductions in resource allocations. These priority activities and the path which connects them are called the "critical path" (Terrey, 1968, p. 23). Funds may be saved by use of this systematic and graphic technique as less time is spent on emergencies and last minute decisions. PERT and CPM allow for more precise management and effective control over resources by providing a basis for analyzing actual times

and actual costs jointly. Anthony and Dearden concluded that PERT and CPM are valid systems for financial management as they identify

> . . . Activities in which it would be desirable to increase costs in order to reduce time, and, conversely, activities in which it would be desirable to lengthen the time in order to reduce costs (Anthony and Dearden, 1980, pp. 692-693).

Budget control is particularly enhanced through the use of a system known as simulation. Such a method involves approaching a problem by constructing a model of a real situation and then manipulating the model in such a way as to draw conclusions about the actual occurrence (p. 380). The preparation and review of a budget is a simulation process and often involves utilization of a computer. Anthony and Dearden recognized the advantages of this method in the realm of financial management:

> Management can ask what the effect of many different types of changes would be and receive almost instantaneous answers. This gives management a chance to participate more fully in the budgetary process (p. 381).

In a study of management systems in education, Montello and Wimberly advanced the strengths of the simulation process with the assumption that the educational environment involves problems of such complexity that consideration of any single solution to the budgetary process may be catastrophic. "It is, therefore, necessary to test all the

possible solutions through the use of simulation before any single one is actually implemented" (Montello and Wimberly, 1975, p. 51). The conclusion was reached by these authorities that a solution providing the best funding model under certain conditions may be identified through the use of simulation.

Management by objectives (MBO), a general management approach, has received considerable attention since Drucker began writing in the 1950s on this concept. MBO involves a way to manage by identifying objectives and applying them as criteria to judge the quality and effectiveness of inputs and activities. A high priority is placed on defining organizational objectives and communicating them to all personnel. With an orientation to systematizing the management approach, it is of definite importance in the financial atmosphere (Boston and Spencer, 1973, p. 5). Harvey specified the manner in which MBO may be used as a management system relating to budget control and resource allocation:

> There must be a direct relationship because without funds, objectives cannot be accomplished. The relationship to the budget, however, can be a close and tight one as, for example, you have when PPBS is used with MBO, or it can be a looser relationship where each administrator is left to budget and make judgments about whether or not funds exist to carry out the objectives (Harvey, 1976, p. 83).

Hence, MBO may be used solely as the financial planning procedure or in combination with other approaches. This same belief was held by McConkey:

> The function and use of budgets and budgetary control are too well known to belabor. We should note, however, that budgets should be viewed as the allocation of resources to objectives; in other words, the budget is tailored to the objectives and plans. Also, budget reporting must follow good principles of responsibility accounting with all status and variance reports going primarily to the manager responsible for the objectives and plans (McConkey, 1975, p. 70).

Management by objectives is a technique designed to accomplish such goals as participants coordinate their efforts toward achievement. Reviewed literature suggested that this approach is being strongly emphasized and spreading quickly to organizations such as higher education institutions (Anthony and Dearden, 1980, p. 652).

In investigating financial management systems used in budget control and resource allocation, it is necessary to include the use of management information systems (MIS). As defined by Luthans, "MIS can be said to be a system of regular or irregular information collection, reduction, storage, and dissemination" (Luthans, 1976, p. 384). In order to provide quality information to make more effective management decisions, MIS may or may not be computer-processed. Those MIS processes which do rely on computer data systems have tailored the automation to their own administrative needs and patterned them after their

own organizational structure. The MIS model, thus, may focus on the financial aspects of institutional operations and represent a ". . . fundamental rethinking of information flows and decisions" (p. 385).

Robert Murdick and Joel Ross who have dealt specifically with the issue of information systems for management asserted that MIS is primarily concerned with financial information.

> All companies have some kind of financial information system; this category of information is the most common in use today. The basis of the system is the flow of dollars throughout the organization, and if they are designed correctly, the profitability and responsibility accounting systems follow the organization structure. These systems involve large amounts of data concerned primarily with historical and internal information, although in some areas of financial planning, the system provides the futuristic look associated with planning. Budgeting is wholly futuristic (Murdick and Ross, 1971, p. 175).

These same principles may be applied to institutions of higher education (Baldridge and Tierney, 1979, p. 4).

## IV. COSTS AND DIFFICULTIES ASSOCIATED WITH FINANCIAL MANAGEMENT SYSTEMS

Numerous factors must be taken into consideration before any specific financial management system is selected for use in higher education institutions. Not only must the cost of implementing the method be determined but the

related difficulties inherent within the methodologies must be analyzed as well.

Prior to an institution making definite commitments to the adoption of any of the described approaches, administrators must first weigh the cost of initiating the system against the derived benefits. Murdick and Ross articulated the importance of this determination:

> Cost is a major resource limitation. The cost to achieve the objective should be compared with the benefits to be derived. You do not want to spend $20,000 to save $10,000 (Murdick and Ross, 1971, p. 452).

Administrators must formulate judgments as to whether the implied costs will be justifiable with respect to anticipated improved effectiveness.

Cost, nonetheless, is only one element to be assessed. Additional difficulties are likewise associated with the establishment of any financial management system. Initially, it will be a complex task to determine which system's structure enhances the overall goals and objectives of the university as well as those of the particular public sector to be served. Caruthers and Orwig noted this issue in their discussion of budgetary practices in postsecondary education:

> Despite the public-administration and business influences that promote more systematic budgetary practice in postsecondary education, one still finds much variety among the states. Practice varies in the public sector by comparison with the private sector, and within the public sector itself (Caruthers and Orwig, 1979, p. 29).

Because of the very nature of the higher education enterprise, goals and objectives are often ". . . ambiguous and progress toward them difficult to measure" (p. 30). As a result, the financial management system will need to encompass the type of planning that allows officials to determine how the budget and resource allocation processes contribute to the accomplishment of the organizational goals.

Organizational climate within the university may prove to be a major obstacle in the designation of any financial management approach. In the past, university heads of budgetary units were asked to provide more instruction for more students and to meet added research and service needs. The outcome was ". . . an expansionist frame of mind that resulted in ever expanding budgets in an upward spiral of costs" (Brown and Reeves, 1978, p. 52). This situation was generally met by the traditional system of incremental increases to meet the needs. Today, on the other hand, the expansion of new resources is not only tapering off but in many instances is rapidly declining. A large budgetary base which is ". . . difficult to adjust because of the many peculiarities of an institution of higher education" confronts universities (p. 53). The situation is perceived adequately in the following account:

> The rapidly changing demands of society and the major emphasis being placed on accountability are forcing institutions to look at all aspects of traditional academic life, to re-evaluate programs and to re-examine the institutional objectives and aspirations. Too many of them have continued to add programs without ever phasing out weak or out-moded ones, and they now find themselves in a position where the cost of continuation may well exceed the available resources. Therefore, the necessity for alternative methods may be more imperative than they realize (p. 53).

In connection with the educational climate there has also arisen an added difficulty of the competitive political arena found within universities. Those persons affected by financial considerations usually have priorities established and vested interests in any previously practiced approach. As Orwig and Caruthers maintained ". . . not all of everyone's goals can be satisfied in economic life. Economizing, therefore, requires a process for determining whose goals shall have priority and to what extent" (Jedamus, Peterson and Associates, 1980, p. 346). Political negotiation, if recognized by those in charge of resource allocation, may provide a mechanism through which social and human values can be reflected in budgetary decisions. Balderston viewed this process as being successful only if those involved in the political arena are also allowed to be active in the financial system as well.

> Faculty, students, and administrators are affected by, and therefore desire to participate in, the development of the institutional budget. Externally, the interests of the alumni, the community and, if it is a publicly funded institution, state agencies and legislators along with federal administrators must also be considered in the development of a budget. The university has become a mixture of institution, enterprise, and agency. This is partly because it has assembled a large and confusing range of activities and operations, but partly also because the major parties at interest want to view it in different ways: the faculty and students, as an institution; the trustees and some administrators, as an enterprise; and the governmental sponsors, as an agency. Conflicts of purpose, law, motivation, and style flow from these different views (p. 347).

Mechanisms built into each financial management system for enabling the resolution of the political conflict must be determined to be of worth to the particular setting before adoption of the method.

Central administrators must fully accept all aspects of the system before its establishment. There must be no concerns that the method unduly interferes with their influence over quality and content of programs. Difficulties may arise, for example, when elements within a new system demonstrate changes for compensation within the income structure (Murdick and Ross, 1971, p. 451). If top administrative support for the methodology is not obtained, the specific technique will not prove successful.

Another difficulty which arises is concerned with manpower needs and personnel availability. These may

become limiting factors in the establishment of any system. Sufficient personnel able to implement and operate the system as well as to foster its success are necessary. The more elaborate and sophisticated systems will be of little value if they cannot be put to use. Again, the human element comes into play if there is an associated need to realign individuals and/or facilities. Expected reactions to each approach must be anticipated.

One final difficulty which needs to be investigated before instituting any management system dealing with finances is that of providing strategic, long-term planning. Many methods for budget control and resource allocation involve only short-term objectives. University administrators must be cognizant of this fact and subsequently choose an approach. While short-term planning in the form of annual budgets is needed, long-range management must also be reflected in the system so as to achieve more effective utilization of personnel, space, and financial resources (Committee for Economic Development, 1973, p. 48). Extensive information on all significant phases of operations and costs including the educational program must be provided if the institution is to make the most of the management system.

## V. SUMMARY

This chapter reviewed the literature related to the formulation of financial management systems for the purpose of budget control and resource allocation in higher education. It concentrated on characteristics of prominent approaches currently in use and described various strengths and limitations associated with the procedures. Costs and necessary factors for the establishment of the systems were detailed while specific difficulties which may be encountered upon adoption were also enumerated. The literature indicated that although no single approach to budget control and resource allocation may be expected to resolve the complexity and conflict inherent in the forces acting on higher education, administrators need to analyze present systems being utilized and appropriate a method most suitable to the objectives of their particular institution. The result must be a systematic and rational process for long-range financial management.

# CHAPTER III

# METHODOLOGY

## I. INTRODUCTION

The available literature offered substantial information concerning descriptions of management systems utilized in budget control and resource allocation within universities. Advantages and limitations were detailed for the most noteworthy approaches as well as suggestions for using these methods within departments of business and finance. Information which was not included in the reviewed material pertained to current utilization and degree of effectiveness of financial management systems within various institutions. Due to such lack of data, this study attempted to identify which systems were in actual use and whether they were recognized as being productive in order to develop guidelines for establishing a systematic and rational process for comparable institutions.

It was initially believed that management systems used in budget control and financial resource allocation would be readily distinguishable and distinctly different from one another. Once the process to develop data had begun, however, it was apparent that numerous systems

contained similar and often exact characteristics of various other approaches. In recognition of this fact, it was necessary to include those systems considered to be the most prominent and those whose elements were unique. It was felt as though the administrators in charge of finance would recognize the terms if their universities had adopted any of these procedures. Opportunity was also provided for individuals to note the use of more than one system by their institution if this proved to be the situation. Having determined these difficulties upon completion of a review of related literature, it was decided to administer a questionnaire to a national sample of 216 four-year, public, accredited institutions so as to produce data about current financial management systems.

## II. DESIGN OF THE QUESTIONNAIRE

In order to formulate an appropriate questionnaire, the researcher began with an extensive review of related literature. Specifically, the literature consisted of general management systems used by higher education institutions; management systems utilized solely for the purpose of budgeting, control of budgets, and allocation of financial resources; expressed views about management approaches and their effectiveness; and any noted current

utilization of the described procedures. Upon completion of the literature examination, it was clear that the material failed to describe specific management systems in current use. Although numerous views were expressed as to which systems maintained the greatest strengths and weaknesses, evidence was missing to verify these conclusions based on present facts.

A questionnaire was developed as the research instrument since it was most capable of obtaining the desired information (Appendix A). Prior to the actual design of the questionnaire, the researcher obtained copies of different questionnaire formats. These were analyzed in conjunction with expressed views of established authorities on research design. The following specific strengths and limitations were stated by Fox:

> Since the questions are on paper and the interaction impersonal, the questionnaire technique brings with it both advantages of that interaction: relatively inexpensive mass coverage of potential respondents and complete standardization of the instructions to which the respondents are exposed. Moreover, the ability to include all response formats provides the researcher with great flexibility in the nature of the information sought. The disadvantages are also those of the impersonal interaction: the necessity to be able to state the questions in advance so that their intent is clear without additional interpretation and explanation, and the real danger that only a small proportion of respondents will return the questionnaire (Fox, 1969, p. 548).

In recognition of these conclusions, the writer attempted to design a questionnaire that would be easy to understand

and was impersonal. In addition, every precaution was taken to maximize the likelihood of the respondent allotting time to complete and return the document. This latter element involved limiting the length of the questionnaire, structuring the format so as to reduce the required writing time, writing the introductory material clearly so that the respondents would know the purpose of the research and use of the data, and allowing some provision for which the respondents might obtain the results of the study.

The initial draft of the questionnaire was based on substantial and careful analysis not only of research authorities but on a study conducted by Kenneth Rodgers and Isabelle Rhodes, 1978, in conjunction with the National Center for Higher Education Management Systems. Consultation with different faculty and administrators at The University of Tennessee resulted in numerous revisions. As a result of the suggestions and analyzed guidelines, it was decided to include both open-end as well as closed questions. The open-end responses were kept to a minimum in order to maintain ease in tabulating and summarizing results as well as to preserve a minimum length of responses. Following the conclusions expressed by Good, the closed question was utilized as such:

> . . . When the investigator's objective is to classify the respondent, when there is little question as to the

> adequacy of respondent information, when the respondent's opinions on the specific topic are well structured, when there are no major barriers to communication, and when the investigator is well informed about the respondents (Good, 1972, pp. 230-231).

The open-end question, conversely, was used when the reverse of these conditions was true.

## III. FIELD TESTING OF THE QUESTIONNAIRE

Once the questionnaire had been designed and formally approved by the researcher's committee, the instrument was subjected to a field testing which included university administrators not contained in the sample. This procedure was established for the purpose of validating the questionnaire in terms of clarity and acceptability of the questions. It was also pretested to eliminate or reword questions and procedures which might prove misleading to the participants as the appropriateness of the total instrument was determined.

Twenty university administrators in charge of business and finance within their institutions were asked to complete the questionnaire as a part of its field testing. In the process of responding, they were urged to note any items which were vague or irrelevant and which would tend to be misleading. They were also requested to state any objections to the questions. In this manner,

internal consistency could be developed within the instrument.

Once the responses to the field testing of the questionnaire were obtained, they were analyzed with respect to the following criteria established by Good:

> 1. Is the question on the subject?
> 2. Is the question perfectly clear and unambiguous?
> 3. Does the question get at something stable, which is typical of the individual or of the situation?
> 4. Does the question pull or have extractive power? Will it be answered by a large enough proportion of respondents to have validity?
> 5. Do the responses show a reasonable range of variation?
> 6. Is the information consistent, in agreement with what is known, and in agreement with expectancy?
> 7. Is the item sufficiently inclusive?
> 8. Is there a possibility of obtaining an external criterion to evaluate the questionnaire? (Good, 1972, p. 235).

With additional revisions made from respondents' suggestions and after application of the above criteria, the questionnaire was judged to have validity.

## IV. SELECTION OF THE SAMPLE SIZE

The sample was drawn from a population of 495 public, four-year accredited institutions. The Accredited Institutions of Postsecondary Education (1980-1981) as published by the American Council on Education was employed as the source for institutions to be included in the study. Since only public, four-year institutions were to be

included, universities were listed which comprised the six accrediting bodies known as MSA/CHE (Middle States Association of Colleges and Schools/Commission on Higher Education); NEASC (New England Association of Schools and Colleges); NCA (North Central Association of Colleges and Schools); NASC (Northwest Association of Schools and Colleges); SACS-Comm. on Coll. (Southern Association of Colleges and Schools-Commission on Colleges); and WASC-Sr. (Western Association of Schools and Colleges-Accrediting Commission for Senior Colleges).

Using the suggested standard to obtain a sample size sufficiently large to provide accuracy of 95 percentage points with a confidence interval of $\pm 2.5$ percent as expressed by Nunnery and Kimbrough, 216 institutions were found to comprise a representative sample size. This figure was obtained through utilization of the following formula based on the Chi Square statistic:

$$n = \frac{X^2 N \emptyset (1-\emptyset)}{d^2 (N-1) + X^2 \emptyset (1-\emptyset)}$$

where

n = required sample size

$x^2$ = table value of Chi Square for one degree of freedom and the desired confidence interval

N = population size

$\emptyset$ = population proportion which it is desired to estimate (assumed to be .5 since this provides maximum sample size)

d = degree of accuracy expressed as a proportion (.05 where $\pm$2.5 percent is the error which will be tolerated).

A confidence level of 95 percent was determined acceptable for this study with the table value of $x^2$ being 3.841 at the 95 percent confidence level (Nunnery and Kimbrough, 1971, p. 72).

Once the list of 495 institutions was developed, the universities were placed into 6 categories based on the specified accrediting bodies as taken from the Accredited Institutions of Postsecondary Education (1980-1981). Each accrediting region was weighted through utilization of the following weighted percentage procedure:

| Region | Number of Institutions In Population | Percent of Population | Number of Institutions in Sample X 216 |
|---|---|---|---|
| MSA/CHE | 75 | .15 | 32 |
| NEASC | 33 | .07 | 15 |
| NCA | 176 | .36 | 78 |
| NASC | 31 | .06 | 13 |
| SACS-Commission on Colleges | 149 | .30 | 65 |
| NASC-Sr. | 31 | .06 | 13 |
| | 495 | 100% | 216 |

Figure 1. Weighted Percentage Procedure.

At this point, the random sampling technique was used to select those institutions to participate. Every university included in each of the six categories was numbered consecutively. Using a table of random digits (Cochran, 1977, p. 19), the appropriate number of universities was selected based on the designated percent for each region.

## V. DISTRIBUTION OF THE QUESTIONNAIRE

Once the instrument was judged to be valid, a cover-letter (Appendix B) was written explaining who the researcher was, the purpose of the study, and in what manner the data from the questionnaire would be used. This letter was directed to chief administrative officers in charge of business and finance. The document not only ensured the confidentiality of the respondents but asked that they return the completed questionnaire within two weeks. In addition, each institution was furnished a code number in order to enable the researcher to contact the nonrespondents. Such a process was explained to the participants in the cover-letter. The cover-letter and the stamped questionnaire were mailed to the institutions comprising the sample.

Approximately two weeks after the initial mailing to the institutions in the sample, a follow-up procedure

was utilized to guarantee a high percentage of return. The procedure consisted of mailing postcards (Appendix C) to those not having already responded. This card was designed to call attention to the questionnaire. After another two weeks had passed since the postcard reminder, a new cover-letter (Appendix D) with a copy of the original questionnaire was then sent to those who still had not responded. The participant was further urged to complete and return the instrument at the earliest, most convenient time in order to increase the predictiveness of the study results. The researcher stopped after this notice was mailed believing that the action taken should be sufficient to remind those participants who would actually respond. A 50 percent return rate was anticipated by the investigator. Upon tabulation of the responses it was noted that a 45.8 percent response rate was obtained after the final mailing.

## VI. TREATMENT OF THE DATA

Once the completed questionnaires were obtained, each was coded in order to directly transfer the data to computer cards for processing. At this point, the coded information was placed on cards and verified. The data were then processed using the Statistical Package for the Social Sciences (SPSS) accessible through The University of Tennessee, Knoxville Computer Center.

Utilizing the SPSS process, descriptive and nonparametric statistical procedures were employed to arrive at conclusions concerning management systems used in budget control and resource allocation as well as perceptions regarding effectiveness of the systems. Because both nominal and ordinal data were included in addition to the descriptive nature of the study, frequency distributions and percentages and cross tabulations were administered to obtain data calculations.

Computer print-out sheets provided the required information and allowed the investigator to summarize the findings of the study. From the recognized findings, existing management systems were both identified and compared in regards to effectiveness and institutional usefulness. This allowed for the establishment of guidelines suggesting which particular systems may be most beneficial in developing qualified resource and budgetary procedures.

# CHAPTER IV

# PRESENTATION, ANALYSIS, AND INTERPRETATION OF DATA

## I. INTRODUCTION

Questionnaires designed to identify financial management systems utilized for budget control and resource allocation were distributed to public four-year universities as previously described in Chapter III. This chapter provides the presentation, analysis, and interpretation of the data collected from the returned instruments.

A return rate of 45.8 percent was achieved as 99 responses were collected from the 216 institutions included in the sample. Of the responses obtained, only 4 administrators (4.0 percent) indicated that no formal system for financial management was adopted by their university. Ninety-two officials (92.9 percent) indicated that some type of approach for budget control and resource allocation was utilized.

## II. PRESENTATION OF DATA

After each individual in the sample completed the questionnaire, the following data calculations were administered with respect to 67 variables comprising the

instrument: (1) frequency analysis x1 to x67; (2) cross tabulations of x60 to x64 by x5 to x19; (3) cross tabulations of x1 and x50 by x65; and (4) cross tabulations of x66 by x67. A list of variables and what each represents is found in Appendix E.

Initially, the frequency counts need to be established for the included variables. The adjusted frequency was interpreted when missing cases were shown while the relative frequency was used in the event of complete data. Since only nominal level data were involved in the first two variables, the number and percentage of response are provided. Table I shows the summary of size of institution. The largest percentage of participants is found in the categories consisting of 2,501-5,000 and 10,001-20,000 students. Table II, in the same manner, provides a summary of responses according to accreditation region. The category containing the most participants is represented by the SACS-Commission on Colleges.

The frequency count formulated by variable 4 (Appendix E) showed which financial management systems were used by participating universities as the primary technique. Table III shows that incremental budgeting was practiced most often with 30.1 percent. Formula budgeting and function-object budgeting represented the next most often used systems with both showing 17.2 percent of responses. Critical path

TABLE I

NUMBER AND PERCENTAGE OF RESPONSES BY SIZE OF INSTITUTION

| Size of Institution | Number of Responses | Percentage of Responses |
|---|---|---|
| 1-2,500 | 14 | 14.3 |
| 2,501-5,000 | 26 | 26.5 |
| 5,001-10,000 | 22 | 22.4 |
| 10,001-20,000 | 26 | 26.5 |
| 20,001-30,000 | 6 | 6.1 |
| 30,001-40,000 | 1 | 1.0 |
| 40,001-50,000 | 2 | 2.0 |
| 50,000+ | 1 | 1.0 |

TABLE II

NUMBER AND PERCENTAGE OF RESPONSES BY ACCREDITATION REGION

| Accreditation Region | Number of Responses | Percentage of Responses |
|---|---|---|
| MSA/CHE | 11 | 14.5 |
| NEASC | 8 | 10.5 |
| NCA | 25 | 32.9 |
| NASC | 1 | 1.3 |
| SACS-Commission on Colleges | 26 | 34.2 |
| WASC-Sr. | 5 | 6.6 |

TABLE III

FINANCIAL SYSTEMS DESIGNATED AS A PRIMARY APPROACH TO BUDGET CONTROL AND RESOURCE ALLOCATION

| System | Number of Responses | Percentage of Responses |
|---|---|---|
| Incremental budgeting | 28 | 30.1 |
| Formula budgeting | 16 | 17.2 |
| Function-object budgeting | 16 | 17.2 |
| Program planning and budget system (PPBS) | 12 | 12.9 |
| Unit budgeting | 11 | 11.8 |
| Performance budgeting | 3 | 3.2 |
| Zero-base budgeting | 3 | 3.2 |
| Cost/benefit analysis | 1 | 1.1 |
| Cost-effectiveness analysis | 1 | 1.1 |
| Management by objectives (MBO) | 1 | 1.1 |
| Program evaluation and review technique (PERT) | 1 | 1.1 |
| Critical path method (CPM) | -- | -- |
| Management information system (MIS) | -- | -- |
| Simulation | -- | -- |

method (CPM), simulation, Delphi, and management information systems (MIS), as may be noted, proved to be the least utilized approaches with no administrators identifying them as the primary system.

Table IV presents the financial systems designated as secondary approaches to budget control and resource allocation. Since the participant was allowed to identify as many techniques as are used by the institution, this summary derived from frequency counts of variables 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, and 48. Although this list is identical to that in Table III, incremental budgeting again proved to be the most widely practiced approach (36.3 percent) with critical path method (CPM) and Delphi representing the least accepted methods (1.0 percent).

The business and financial administrator was shown in Table V as being the individual who most often was charged with the responsibility of developing the primary financial management system. Thirty respondents designated the "other" category and specified particular personnel who performed the duty in their institution. In no instances were students or trustees indicated to be the principal figure involved with this duty.

Table VI shows the 10 cost categories which were developed as a result of responses to variable 66. Although numerous individuals stated that it was impossible to

TABLE IV

FINANCIAL SYSTEMS DESIGNATED AS A SECONDARY APPROACH TO BUDGET CONTROL AND RESOURCE ALLOCATION

| System | Number of Responses | Percentage of Responses |
|---|---|---|
| Incremental budgeting | 36 | 36.3 |
| Function-object budgeting | 32 | 32.3 |
| Formula budgeting | 30 | 30.3 |
| Unit budgeting | 28 | 28.2 |
| Cost/benefit analysis | 25 | 25.2 |
| Performance budgeting | 22 | 22.2 |
| Program planning and budget system (PPBS) | 21 | 21.2 |
| Cost-effectiveness analysis | 18 | 18.1 |
| Zero-base budgeting | 16 | 16.1 |
| Management information system (MIS) | 13 | 13.1 |
| Management by objectives (MBO) | 11 | 11.1 |
| Program evaluation and review technique (PERT) | 9 | 9.1 |
| Simulation | 3 | 3.0 |
| Critical path method (CPM) | 1 | 1.0 |
| Delphi | 1 | 1.0 |

TABLE V

NUMBER AND PERCENTAGE OF RESPONSES TO INDIVIDUAL RESPONSIBLE FOR DEVELOPMENT OF THE PRIMARY FINANCIAL MANAGEMENT SYSTEM

| Individual | Number of Responses | Percentage of Responses |
|---|---|---|
| President | 9 | 9.5 |
| Business and financial administrator | 54 | 56.8 |
| Trustee | -- | -- |
| Students | -- | -- |
| Outside consultant | 1 | 1.1 |
| Professional negotiator | 1 | 1.1 |
| Other | 30 | 31.6 |

TABLE VI

NUMBER AND PERCENTAGE OF RESPONSES TO INITIAL COST OF IMPLEMENTING THE PRIMARY FINANCIAL MANAGEMENT SYSTEM

| Cost Categories | Number of Responses | Percentage of Responses |
|---|---|---|
| $0-$4,999 | 2 | 9.5 |
| $5,000-$9,999 | 1 | 4.8 |
| $10,000-$14,999 | 2 | 9.5 |
| $15,000-$19,999 | 2 | 9.5 |
| $20,000-$24,999 | -- | -- |
| $25,000-$29,999 | 2 | 9.5 |
| $30,000-$34,999 | 1 | 4.8 |
| $35,000-$39,999 | -- | -- |
| $40,000-$44,999 | 1 | 4.8 |
| $45,000+ | 10 | 47.6 |

estimate the initial cost of implementing the primary management system, 47.6 percent indicated that the level of $45,000+ represented the most appropriate monetary category for this purpose. It is also appropriate to interpret the mean of this variable since this type of data represents interval level data. Indicating a mean of 6.95, $29,000 proved the average implementation cost.

Other variables in the questionnaire represented interval level data and may be fully interpreted. Variables 5 through 19 give ratings for effectiveness of designated primary financial management systems. As the questionnaire explained, "1" represented ineffective and "8" showed a superior system. Table VII summarizes the mean ratings of the subsequent approaches. Cost/benefit analysis and management by objectives (MBO) received mean ratings of 8.0. This fact, however, lacks substantial significance since only one individual for each system identified it as primary. Thus, with additional administrators designating performance budgeting, it may be concluded as being the most effective with a mean rating of 7.0. Formula budgeting, on the other hand, was noted as the least effective of those identified with a mean rating of 4.8. Program evaluation and review technique (PERT), critical path method (CPM), simulation, Delphi, and management information systems (MIS) possessed no mean rating since these were not identified as primary systems.

TABLE VII

EFFECTIVENESS RATINGS OF DESIGNATED PRIMARY SYSTEMS

| System | Mean Rating | Number of Responses |
|---|---|---|
| Cost/benefit analysis | 8.0 | 1 |
| Management by objectives (MBO) | 8.0 | 1 |
| Performance budgeting | 7.0 | 3 |
| Zero-base budgeting (ZBB) | 6.6 | 3 |
| Program planning and budget system (PPBS) | 6.2 | 9 |
| Unit budgeting | 6.0 | 11 |
| Function-object budgeting | 5.5 | 15 |
| Incremental budgeting | 5.2 | 29 |
| Cost-effectiveness analysis | 5.0 | 1 |
| Formula budgeting | 4.8 | 16 |
| Critical path method (CPM) | -- | -- |
| Delphi | -- | -- |
| Management information system (MIS) | -- | -- |
| Program evaluation and review technique (PERT) | -- | -- |
| Simulation | -- | -- |

Table VIII summarizes the mean ratings of the level of effectiveness for those systems designated as secondary techniques. The same eight-point scale was administered with the data being derived from variables 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, and 49. Critical path method (CPM) received a 7.0 mean rating but was identified by only one individual. Simulation, hence, may be considered as the most effective secondary system with greater response and a mean rating of 6.3. Incremental budgeting, conversely, was shown to represent the least effective technique with a mean rating of 4.1.

Variable 64 as presented in Table IX manifested an additional summary of the level of effectiveness of the primary system. By noting the frequency counts, 20 respondents (21.3 percent) indicated that their technique was very satisfactory, 65 (69.1 percent) answered as satisfactory, 9 (9.6 percent) chose unsatisfactory, and none exhibited a level of very unsatisfactory.

The next computer calculation which must be examined is that of cross tabulations. Cross tabulations were initially administered for x60 to x64 by x5 to x19. In noting the results of computations, no cross tabulations represented significant statistics since the number of valid cells with expected frequency of less than 5.0 was not less

TABLE VIII

EFFECTIVENESS RATINGS OF DESIGNATED SECONDARY SYSTEMS

| System | Mean Rating | Number of Responses |
|---|---|---|
| Critical path method (CPM) | 7.0 | 1 |
| Simulation | 6.3 | 3 |
| Management by objectives (MBO) | 6.0 | 11 |
| Cost-effectiveness analysis | 5.8 | 18 |
| Unit budgeting | 5.7 | 28 |
| Program evaluation and review technique (PERT) | 5.6 | 9 |
| Performance budgeting | 5.5 | 22 |
| Cost/benefit analysis | 5.4 | 25 |
| Management information system (MIS) | 5.3 | 13 |
| Program planning and budget system (PPBS) | 5.2 | 21 |
| Delphi | 5.0 | 1 |
| Function-object budgeting | 5.0 | 32 |
| Formula budgeting | 4.9 | 30 |
| Zero-base budgeting (ZBB) | 4.3 | 16 |
| Incremental budgeting | 4.1 | 36 |

TABLE IX

NUMBER AND PERCENTAGE OF RESPONSES TO OVERALL EFFECTIVENESS OF PRIMARY FINANCIAL MANAGEMENT SYSTEMS

| Classification | Number of Responses | Percentage of Responses |
|---|---|---|
| Very satisfactory | 20 | 21.3 |
| Satisfactory | 65 | 69.1 |
| Unsatisfactory | 9 | 9.6 |
| Very unsatisfactory | -- | -- |

than 20 percent. However, it is appropriate to recognize the percentage values of variable 64 with variables 5 through 19. This calculation provides the overall effectiveness level with each of the primary systems. In responding to the effectiveness of program planning and budget system (PPBS), 11.1 percent expressed very satisfactory, 77.8 percent chose satisfactory, and 11.1 percent designated unsatisfactory. Zero-base budgeting (ZBB) received 33.3 percent very satisfactory ratings, 66.7 percent satisfactory, and no unsatisfactory responses. With respective rankings, incremental budgeting maintained 14.3 , 71.4, and 14.3 percent. Formula budgeting realized 25 percent very satisfactory, 68.8 percent satisfactory, and 6.3 percent unsatisfactory. Performance budgeting likewise acquired 33.3 percent very satisfactory, 66.7 percent satisfactory, and no unsatisfactory ranks. Function-object budgeting obtained 33.3 percent very satisfactory, 53.3 percent satisfactory, and 13.3 percent unsatisfactory. In like manner, unit budgeting acquired 27.3 percent very satisfactory, 72.7 percent satisfactory, and no ratings of unsatisfactory. Additional systems designated as primary approaches lacked sufficient data to realize similar statistical calculations.

Upon close examination of the cross tabulations of x1 and x50 by x65, valid statistics are lacking. In interpreting certain percentages, however, it may be noted

that the highest percentage (33.3 percent) of respondents designating a democratic level of involvement in the primary financial management system represented institutions with 20,001-30,000 students. An autocratic level was provided most often (50.0 percent) in institutions of 40,001-50,000 students. A laissez-faire situation was denoted most frequently (33.3 percent) in universities of 20,001-30,000 students while a team approach was shown to typify the categories of 30,001-40,000 and 50,000+ students.

With respect to level of involvement in the primary financial management system and the individual most responsible for developing the system, the cross tabulation of x50 to x65 provided the results. The democratic level was most utilized (33.3 percent) when the president designated the primary system while the autocratic approach was demonstrated when selection was by the business and financial administrator (22.4 percent). A laissez-faire environment existed as a result of some "other" individual not addressed in the questionnaire given responsibility. Selection of the financial system by outside consultants and professional negotiators evolved into a team approach involvement level.

Valid levels of cells having expected cell frequencies less than 5.0 were not obtained in the cross tabulation of variables 66 and 67. This calculation involved the issue of initial implementation cost of the primary

financial management system. Most participants (70.0 percent) who stated that the cost of implementation had not been justified with respect to improved effectiveness were within the cost category of $45,000+. Those who replied affirmatively to this issue designated amounts of $5,000-$9,999, $10,000-$14,999, $15,000-$19,999, $25,000-$29,999, $30,000-$34,999, and $40,000-$44,999.

## III. ANALYSIS OF DATA

Data gathered through responses to the questionnaire indicated that numerous financial management systems are currently being used for budget control and resource allocation. Those methodologies designed as primary systems included program planning and budget system (PPBS), zero-base budgeting (ZBB), cost/benefit analysis, cost-effectiveness analysis, incremental budgeting, formula budgeting, performance budgeting, function-object budgeting, unit budgeting, program evaluation and review technique (PERT), and management by objectives (MBO). The most effective of these was shown to be performance budgeting. In distinguishing size of institution with the most widely accepted primary system, Table X shows the results. In this instance, incremental budgeting was recognized to be the most popular. The same results were realized when the most popular primary system was designated for accreditation

TABLE X

MOST USED PRIMARY FINANCIAL SYSTEM BY SIZE OF INSTITUTION

| Financial System | Size of Institution | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | 1-2,500 | 2,501-5,000 | 5,001-10,000 | 10,001-20,000 | 20,001-30,000 | 30,001-40,000 | 40,001-50,000 | 50,000+ |
| Program planning and budget system | | 5 | | | | | | |
| Zero-base budgeting | | | | | | | | |
| Cost/benefit analysis | | | | | | | | |
| Cost-effectiveness analysis | | | | | | | | |
| Incremental budgeting | | 5 | 6 | 13 | 2 | 1 | 1 | 1 |
| Formula budgeting | 4 | 5 | | | | | | |
| Performance budgeting | | | | | | | | |
| Function-object budgeting | | 5 | 6 | | | | | |
| Unit budgeting | | | | | 2 | | | |
| Program evaluation and review technique | | | | | | | | |
| Critical path method | | | | | | | | |
| Simulation | | | | | | | | |
| Management by objectives | | | | | | | | |
| Delphi | | | | | | | | |
| Management information system | | | | | | | | |

region. Table XI shows that out of the six regions included in the sample, four preferred this system.

Similar conclusions may be reached with regards to those financial systems deemed as secondary approaches. Since the participants were allowed to identify as many techniques as were included in their budget control and resource allocation procedure, respondents replied uniquely. Thirteen administrators identified only 1 secondary method while 1 marked as many as 11. Incremental budgeting with 36.3 percent was chosen as the most accepted secondary methodology. All of the listed systems were identified by at least one institution. There was no discernible pattern to suggest which type of process would be most consistent with specific primary systems.

The business and financial administrator was shown to be the individual who most frequently developed this type of management system within an institution. Several other positions not included on the questionnaire were noted, nonetheless, by respondents.

Variables 51, 52, and 53 are contained within questionnaire items 6 through 8 and dealt with provisions established within the primary system for continued improvement in resource and budgetary management. See Appendix A for the questions in their entirety. Tables XII and XIII show that the majority of participants answered

TABLE XI

MOST USED PRIMARY FINANCIAL SYSTEM BY ACCREDITATION REGION

| Financial System | Accreditation Region | | | | | |
|---|---|---|---|---|---|---|
| | MSA/CHE | NEASC | NCA | NASC | SACS-Commission on Colleges | WASC-Sr. |
| Program planning and budget system | | | | | | |
| Zero-base budgeting | | | | | | |
| Cost/benefit analysis | | | | | | |
| Cost-effectiveness analysis | | | | | | |
| Incremental budgeting | 3 | 2 | 8 | | 6 | |
| Formula budgeting | | | | 1 | 6 | 2 |
| Performance budgeting | | | | | | |
| Function-object budgeting | 3 | | | | | |
| Unit budgeting | | | | | | |
| Program evaluation and review technique | | | | | | |
| Critical path method | | | | | | |
| Simulation | | | | | | |
| Management by objectives | | | | | | |
| Delphi | | | | | | |
| Management information system | | | | | | |

TABLE XII

NUMBER AND PERCENTAGE OF RESPONSES INDICATING PRIMARY SYSTEM SUPPORT FOR CONTINUED IMPROVEMENT IN RESOURCE MANAGEMENT

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Yes | 57 | 60.0 |
| Unsure | 13 | 13.7 |
| No | 25 | 26.3 |

TABLE XIII

NUMBER AND PERCENTAGE OF RESPONSES INDICATING PRIMARY SYSTEM SUPPORT FOR CONTINUED IMPROVEMENT IN BUDGETARY MANAGEMENT

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Yes | 66 | 69.5 |
| Unsure | 8 | 8.4 |
| No | 21 | 22.1 |

affirmatively and, hence, stated that their primary systems did furnish sustaining improvement procedures. Table XIV, nevertheless, manifests mixed conclusions to this issue as the majority of replies stated that the primary system did not include long-range plans for purposes of financial management. Forty-nine individuals (54.4 percent) replied negatively to the inquiry while only 31 positive answers (34.4 percent) were given.

As is shown in Table XV, the overwhelming majority of respondents stated that financial needs had been analyzed for each department. Seventy-five individuals (79.8 percent) replied positively to this assertion while only 16 (17.0 percent) answered negatively. In the same manner, Table XVI indicates that 63 administrators (67.0 percent) replied "yes" to the issue of their primary methods allowing for analysis of financial requirements for every academic program. Only 25 "no" responses (26.6 percent) were identified.

Questions 11 through 13 (Appendix A) contain variables 56 through 58 and dealt with policies inherent within the primary system for coordinating adequate communication between the financial department, other internal elements within the institution, and external agencies. The majority of participants expressed positive statements concerning communication factors related to the main financial methodology. Table XVII shows 56 affirmative

TABLE XIV

NUMBER AND PERCENTAGE OF RESPONSES INDICATING PRIMARY SYSTEM SUPPORT OF LONG-RANGE PLAN FOR PURPOSES OF FINANCIAL MANAGEMENT

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Yes | 31 | 34.4 |
| Unsure | 10 | 11.1 |
| No | 49 | 54.4 |

TABLE XV

NUMBER AND PERCENTAGE OF RESPONSES INDICATING PRIMARY SYSTEM SUPPORT FOR ANALYSIS OF FINANCIAL REQUIREMENTS FOR EVERY DEPARTMENT

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Yes | 75 | 79.8 |
| Unsure | 3 | 3.2 |
| No | 16 | 17.0 |

TABLE XVI

NUMBER AND PERCENTAGE OF RESPONSES INDICATING PRIMARY SYSTEM SUPPORT FOR ANALYSIS OF FINANCIAL REQUIREMENTS FOR EVERY ACADEMIC PROGRAM

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Yes | 63 | 67.0 |
| Unsure | 6 | 6.4 |
| No | 25 | 26.6 |

TABLE XVII

NUMBER AND PERCENTAGE OF RESPONSES INDICATING PRIMARY SYSTEM SUPPORT OF POLICY FOR GENERATING COMMUNICATION WITHIN THE FINANCIAL DEPARTMENT

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Yes | 56 | 60.9 |
| Unsure | 11 | 12.0 |
| No | 25 | 27.2 |

replies (60.9 percent) with respect to whether the primary system contained a policy for generating communication within the financial department. Only 25 negative answers (27.2 percent) may be noted. Concerning a policy for coordinating communication between the financial department and other sectors within the institution, Table XVIII demonstrates that 71 "yes" responses (77.2 percent) were obtained and only 14 "no" answers (15.2 percent). A final aspect of communication--that of maintaining a policy designed to provide feedback from the financial department to the external community--is given positive emphasis in Table XIX as 48 administrators (52.2 percent) agreed that their primary system accomplished this objective while 37 individuals (40.2 percent) made no such claim.

Table XX shows that 79 administrators (84.0 percent) maintained positive attitudes regarding the issue of making decisions. From question 14 (Appendix A) it was established that only 10 individuals (10.6 percent) believed that the primary system utilized did not produce a reporting procedure providing financial executives with necessary data for making decisions.

In order to identify whether any procedures were built into the primary system for determining the degree of effectiveness, variables 60 through 64 were designed. These items were contained in questions 15 through 19 of the

TABLE XVIII

NUMBER AND PERCENTAGE OF RESPONSES INDICATING PRIMARY SYSTEM SUPPORT OF POLICY FOR COORDINATING COMMUNICATION BETWEEN THE FINANCIAL DEPARTMENT AND OTHER SECTORS WITHIN THE INSTITUTION

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Yes | 71 | 77.2 |
| Unsure | 7 | 7.6 |
| No | 14 | 15.2 |

TABLE XIX

NUMBER AND PERCENTAGE OF RESPONSES INDICATING PRIMARY SYSTEM SUPPORT OF POLICY PROVIDING FEEDBACK FROM THE FINANCIAL DEPARTMENT TO THE EXTERNAL COMMUNITY

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Yes | 48 | 52.2 |
| Unsure | 7 | 7.6 |
| No | 37 | 40.2 |

TABLE XX

NUMBER AND PERCENTAGE OF RESPONSES INDICATING PRIMARY SYSTEM SUPPORT OF REPORTING PROCEDURE ALLOWING ADMINISTRATORS NECESSARY DATA FOR MAKING DECISIONS

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Yes | 79 | 84.0 |
| Unsure | 5 | 5.3 |
| No | 10 | 10.6 |

testing instrument (see Appendix A). Table XXI shows that the majority of the individuals responded positively to the issue of the primary system providing sufficient information to assess the effectiveness with which funds are being used. Forty-three "yes" answers (46.7 percent) were given while only 31 "no" replies (33.7 percent) were made. Table XXII and Table XXIII follow this same concept but yield mixed reactions to this matter. In Table XXII, 78 administrators (83.0 percent) stated that their primary system provided adequate fiscal statements to the administrator. Table XXIII, conversely, demonstrated the opposite approach as the majority of replies were negative. Forty-six individuals (49.5 percent) expressed lack of a technique for evaluating the performance of the primary financial management system. Only 29 (31.2 percent) positive replies were received. Table XXIV deals with the issue of current audits maintained by the institutions. The majority of respondents again were satisfied with their primary system as 85 (92.4 percent) answered that such financial documents were positive about their financial management. Only 2 (2.2 percent) answered negatively. As has been previously noted, the largest number of participants expressed "satisfactory" or "very satisfactory" comments regarding the effectiveness of the main financial management approach.

TABLE XXI

NUMBER AND PERCENTAGE OF RESPONSES INDICATING PRIMARY SYSTEM SUPPORT OF FEEDBACK FOR ASSESSING EFFECTIVENESS OF FUNDS BEING USED

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Yes | 43 | 46.7 |
| Unsure | 18 | 19.6 |
| No | 31 | 33.7 |

TABLE XXII

NUMBER AND PERCENTAGE OF RESPONSES INDICATING PRIMARY SYSTEM SUPPORT FOR ADEQUATE FISCAL STATEMENTS TO ADMINISTRATOR

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Yes | 78 | 83.0 |
| Unsure | 4 | 4.3 |
| No | 12 | 12.8 |

TABLE XXIII

NUMBER AND PERCENTAGE OF RESPONSES INDICATING SUPPORT OF TECHNIQUE FOR EVALUATING PERFORMANCE OF PRIMARY FINANCIAL MANAGEMENT SYSTEM

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Yes | 29 | 31.2 |
| Unsure | 18 | 19.4 |
| No | 46 | 49.5 |

TABLE XXIV

NUMBER AND PERCENTAGE OF RESPONSES INDICATING CURRENT AUDITS AND POSITIVE MEASURES OF UTILIZED FINANCIAL MANAGEMENT

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Yes | 85 | 92.4 |
| Unsure | 5 | 5.4 |
| No | 2 | 2.2 |

Table XXV provides a summary of responses to the level of involvement in the primary financial management system. The most responses may be noted in the team approach category. Fifty-one (58.6 percent) identified this answer while only 7 (8.0 percent) designated the category of laissez-faire. It was established with the cross tabulations that there was not a relationship between size of institution and level of involvement.

As has previously been noted in this chapter, the average cost of initially implementing the primary financial management system was found to be $29,000. Table XXVI shows that the majority of participants believed this monetary expense to be justified with respect to improved effectiveness. Thirty-nine individuals (50.6 percent) replied positively to this factor while only 7 respondents (9.1 percent) answered conversely. It must also be recognized that a large number (40.3 percent) expressed "unsure" acknowledgements with respect to the cost justification factor.

The final inquiry on the questionnaire asked administrators to identify major difficulties experienced in the management of financial resources. Numerous obstacles characteristic of divergent aspects of budget control and resource allocation were noted. These included financial resources not maintaining pace with inflationary factors;

TABLE XXV

NUMBER AND PERCENTAGE OF RESPONSES TO LEVEL OF INVOLVEMENT IN THE PRIMARY FINANCIAL MANAGEMENT SYSTEM

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Democratic | 12 | 13.8 |
| Autocratic | 17 | 19.5 |
| Laissez-faire | 7 | 8.0 |
| Team approach | 51 | 58.6 |

TABLE XXVI

NUMBER AND PERCENTAGE OF RESPONSES INDICATING WHETHER COST OF IMPLEMENTING PRIMARY MANAGEMENT SYSTEM WAS JUSTIFIED WITH RESPECT TO IMPROVED EFFECTIVENESS

| Response | Number of Responses | Percentage of Responses |
|---|---|---|
| Yes | 39 | 50.6 |
| Unsure | 31 | 40.3 |
| No | 7 | 9.1 |

lack of administrative ability to handle computerized reports; limitations placed on appropriated funds; lack of adequate reporting procedures and detailed information; inconsistent data from previous years; significant program changes on an annual basis; inadequate and outdated financial computer software; and inability of first-level management to understand the management system.

Other difficulties associated with the management of financial resources were lack of sufficient revenue; inflexibility due to restrictions by state legislature and state budget office; absence of input to system analyst in developing necessary methods; occasional deficits due to unanticipated enrollment declines; communication of management strategies to participants; bureaucratic constraints imposed by state officials as a result of representing a public institution; reallocation of financial resources to meet changing needs; lack of interest by participants to implement management techniques and exercise budget control; lack of procedures to establish budget control at the purchase request level; measurement of effectiveness of programs and allocations; uncertainty of yearly funding levels; and evaluation of departmental results and productivity in support of institutional goals.

# IV. INTERPRETATION OF DATA

The purpose of this study was to identify financial management systems used for budget control and resource allocation. The perceived effectiveness by financial administrators in the institutions was also examined. The functions presented in the preceding tables provide the tabulated results of the data gathered through the research questionnaire.

Based on the evidence obtained from responses, it can be concluded that numerous financial management systems are currently in practice. Many of these methodologies are used independently while others are put into practice in combination with several approaches. The most widely accepted primary financial management system was found to be incremental budgeting. Participants provided this procedure with a mean effectiveness ranking of 5.2. The system most often practiced in conjunction with a primary method was also incremental budgeting. It was given a secondary mean effectiveness rating of 4.1.

Only 4 administrators (4.0 percent) of the 99 returned questionnaires noted that no financial management system was employed in their institutions. The reasons

stated for the lack of such methodology included the fact that no formal documented system was needed. These individuals, nonetheless, expressed the belief that the time was rapidly approaching when a financial management system would be a necessity.

# CHAPTER V

## SUMMARY, FINDINGS AND RECOMMENDATIONS OF THE STUDY

### I. INTRODUCTION

The first section of this chapter presents a summary of the study including its purposes, the methodology utilized, and a synopsis of each chapter. The second division presents major findings reached as a result of the responses to each research question. The final section provides recommendations based on the results of the study as well as guidelines for establishing resource and budgetary management systems.

### II. SUMMARY

The purposes of this study were to identify existing management systems utilized in budget control and resource allocation and assess their effectiveness as expressed by administrators in charge of business and finance within selected public, four-year universities in the United States. The study also sought to suggest guidelines for establishing qualified resource and budgetary management systems based on accumulated data about present procedures in use. Finally, the study sought to analyze the reasons provided by those administrators who employed no management system for budgeting and resource allocation.

Initially questionnaires were designed to identify the type of budgetary and resource management system in use. Universities were chosen from a random sample of public, four-year, accredited institutions. Using the suggested standard to obtain a representative sample size, a sample of 216 universities was randomly drawn from the total population of 495. The institutions were placed into six categories based on accrediting regions in order to follow a weighted percentage procedure for establishing the number to be included from each unit.

Administrators in charge of business and finance were sent the research instrument along with a cover-letter explaining who the researcher was, the purpose of the study, and in what manner the data would be used. A 45.8 percent response rate from 99 institutions was obtained; 92.9 percent designated a financial management system in use while 4.0 percent maintained that no such procedure existed. Data from the returned questionnaires were processed and analyzed through use of the computer-based Statistical Package for the Social Sciences.

The reporting of this study was divided into five chapters. Chapter I contained the introduction, the statement of the problem, the purpose for the study, the significance of the study, the assumptions and constraints of the study, the procedures of the study, questions

relevant to the study, the definition of related terms, and the organization of the study. Chapter II presented a review of related literature including the history of financial management systems, factors in developing financial management systems, characteristics of the more noteworthy financial management systems in use, and the costs and difficulties associated with financial management systems. Chapter III was comprised of the methodology used for implementation of the study including the questionnaire design, field testing of the instrument, selection of the sample, distribution of the questionnaire, and treatment of the data. Chapter IV contained the presentation, analysis, and interpretation of the data.

## III. FINDINGS

From careful analysis of the data, it is apparent that institutions of higher education are utilizing a financial management system for budget control and resource allocation. As has been reported previously, 92 universities (92.9 percent) designated maintenance of some type of approach while only 4 institutions (4.0 percent) identified no system.

Upon more detailed study of the mean effectiveness ratings for each system, administrators in charge of business and finance generally perceived the systems to be

moderately successful. Having utilized an eight-point scale on the research instrument to rank the effectiveness of the method, "1" represented ineffective and "8" showed a superior system. Cost/benefit analysis and management by objectives (MBO) exhibited the highest mean ratings with 8.0 averages. However, only one participant for each system identified the approach as primary; hence, the effectiveness ratings lack substantial verification. The approaches having greater proof of utilization scored in the moderate range. For instance, incremental budgeting received the most support but manifested a mean rating of only 5.24. Other designated approaches were given progressively lower marks. Formula budgeting represented the least effective system with a mean rating of 4.87.

Only 10 institutions (9.9 percent) stated that a primary financial management system was used as the sole method. Eighty-nine universities (90.1 percent), on the other hand, noted the employment of 1 or more secondary systems in conjunction with the primary approach. Numerous respondents specified utilization of secondary systems for particular purposes. One system, management by objectives (MBO), was distinguished most often by administrators. It was denoted expressly for the purpose of establishing staff and faculty salaries and increases in the budgeting process.

Due to the high percentage of "no" and "unsure" answers pertaining to the issue of long-range planning as well as the uncertainty expressed concerning cost justification of the primary systems, evidence was furthered for the necessity of administrators to improve financial management practices. University administrators, however, may not be given a voice in determining which system to employ. This was evidenced in the number of participants who stated that the utilized system had been mandated by state officials.

General findings reached as a result of the responses paralleled those contained in the literature. As was noted in the study conducted by the SMU Institute of Technology emphasizing educational finance, universities are initiating various types of financial management systems. This has grown out of necessity and must continue, as was contended by George Weathersby, to develop more effective and precise funding and budgeting procedures.

From the lack of total satisfaction expressed by respondents in this study, higher education executives directly responsible for financial functions must analyze the institutional setting and objectives as well as the specific management systems. Responsibility must then be accorded them for adopting the most practical and

appropriate method. This conclusion was confirmed by McFarland as he proposed that different systems adapt more easily to definite groupings. This study showed that the most representative of these techniques was incremental budgeting. Financial authority Richard Heydinger asserted this same approach in his findings (Jedamus, Peterson and Associates, 1980, p. 310).

Specific findings enumerating additional facts revealed through data analysis are provided with the following answers to research questions contained in the study:

Question One

What management systems are currently used by institutions of higher education for budget control and resource allocation?

Incremental budgeting was designated as the most widely used primary system. Other primary approaches included program planning and budget system (PPBS), zero-base budgeting (ZBB), cost/benefit analysis, cost-effectiveness analysis, formula budgeting, performance budgeting, function-object budgeting, unit budgeting, and management by objectives (MBO). Additional methods were shown to be utilized in conjunction with the primary technique. Incremental budgeting was also identified as

the most employed secondary system. Further procedures noted for secondary use included program planning and budget system (PPBS), zero-base budgeting (ZBB), cost/benefit analysis, cost-effectiveness analysis, formula budgeting, performance budgeting, function-object budgeting, unit budgeting, program evaluation and review technique (PERT), critical path method (CPM), simulation, management by objectives (MBO), Delphi, and management information system (MIS).

Question Two

Who is primarily responsible for developing such a managing tool within the financial realm of the institution?

The business and financial administrator was shown to be the individual most often responsible for developing the primary financial management system in the institution. Other executives including the president, outside consultant, and professional negotiator were also identified. Additional persons not included on the questionnaire were listed as being charged with this duty. The most significant of these included state officers, academic deans, state coordinating board members, officials from boards of regents, directors of management systems, and mandates from state legislatures.

Question Three

Does this procedure provide continued improvement in resource and budgetary management?

The majority of respondents stated that the primary financial system utilized in their institution did provide continued improvement in resource and budgetary management. How effective this factor proved to be depended largely on the specific system. Most participants, however, noted that their system was not successful in the provision of a specific long-range plan in this area.

Question Four

Have financial needs been analyzed for each department and academic program?

Again depending upon the specific management system employed, the majority of administrators reported that financial needs had been analyzed for each department and academic program. More affirmative replies were shown with respect to analysis for each department rather than for each academic program.

Question Five

Are procedures established within the management system for coordinating adequate communication between the financial department, other internal elements within the institution, and external agencies?

Participants responded positively to this inquiry and specified procedures for exchange of communication at the different levels. General techniques inherent within the primary management system included the establishment of financial management review committees consisting of individuals outside the financial department. Computer analyses were given as another general communication avenue.

Unique practices for maintaining communication within the financial department were noted. Such methods included departmental budget requests and reports, monthly budget reviews, interaction with institutional budget advisory committees, staff meetings, internal audit results, information disseminated by the director and staff, and personal communication as dictated by size of institution.

With respect to employing a policy for coordinating communication between the financial department and other sectors within the institution, numerous practices were specified. These included monthly fiscal reports to each major department, budget workshops at the developmental stage, memorandums from the chancellor's office, budget conferences, and regular meetings between budgetary unit heads and the financial department.

Financial administrators listed policies used by their institutions to allow feedback from the financial

department to the external community. These procedures incorporated annual reports to state boards and officials, news articles in local media as well as state publications, annual comprehensive financial reports, required monthly reports to state budget offices, public records, audit reports, and news releases from the public relations department.

Question Six

Does this system utilize a reporting procedure which provides administrators involved in the financial field the necessary data for making decisions?

Results of the data analysis prove that an overwhelming majority of financial administrators believed that their primary systems provided necessary data for making decisions. Numerous procedures for accomplishing this objective were described. The most prominent of these included weekly and monthly reports comparing the budget balance, expenditures, and encumbrances; departmental and institutional budgets; review of accounting statements; departmental consultations; computer printouts of account activity; overview reports indicating surplus or deficit conditions with explanations of change; and feedback from faculty and students.

Question Seven

Were any procedures in the system designed to determine the degree of effectiveness for the management system used?

Data gathered from the returned research instruments provide a mixed and incomplete answer to this inquiry. The majority of respondents affirmed that the amount and kind of feedback provided administrators with sufficient information to assess the effectiveness with which funds were being used. They also noted that the primary system provided adequate fiscal statements to the administrator. An additional procedure designed to determine the degree of effectiveness for the approach was that of audits. The majority of participants stated that current audits were positive about their financial management. In general, the largest percentage of individuals characterized the overall effectiveness of the primary financial management system as satisfactory. They responded negatively, however, with respect to the existence of a particular technique for evaluating the performance of the approach.

Question Eight

Was the financial management system effective in budgetary control and resource allocation?

This question can only be answered with investigation of each financial management system designated as being in current use. Every respondent rated the approach employed by the respective institution with respect to effectiveness in budgetary control and resource allocation. From the aforementioned mean rankings, no system designated by more than one administrator was perceived as exhibiting a high level of effectiveness. The moderate range of satisfaction was shown for the majority of approaches.

Question Nine

Was there a relationship between size of institution and level of involvement?

No relationship existed between size of institution and level of involvement. The significance level and chi-square statistic demonstrated in the cross tabulation of these variables illustrated this result. The significance level was 0.93 while 87.5 percent of the valid cells had expected cell frequency less than 5.0. A chi-square value of 12.15 with 21 degrees of freedom further verified lack of any relationship.

Question Ten

Was the initial cost of implementing the management system justifiable with respect to improved effectiveness?

Due to the difficulty expressed by participants in estimating the initial cost of implementing the primary management system in their institutions, it is impossible to ascertain any conclusion to this question. The majority of administrators stated that they were unable to provide any cost approximation. At the same time, nonetheless, the largest percentage of respondents answered affirmatively to the issue of whether the cost of implementation of the primary system had been justified with respect to improved effectiveness. Without having knowledge of actual costs, any judgment of monetary justification on the part of the participants is not valid.

Question Eleven

What were the difficulties in the management of financial resources?

This question was presented as an open-end inquiry on the research instrument; thus, administrators were allowed to respond freely. Numerous difficulties in the management of financial resources were noted by participants. The following are representative of those problems unique in nature:

1. Financial resources not maintaining pace with inflationary factors.

2. Lack of administrative ability to handle computerized reports.

3. Limitations placed on appropriated funds.

4. Lack of adequate reporting procedures and detailed information.

5. Inconsistent data from previous years.

6. Significant program changes on an annual basis.

7. Inadequate and outdated financial computer software.

8. Inability of first-level management to understand the management system.

9. Lack of sufficient revenue.

10. Inflexibility due to restrictions by state legislature and state budget office.

11. Absence of input to system analyst in developing necessary methods.

12. Occasional deficits due to unanticipated enrollment declines.

13. Communication of management strategies to participants.

14. Bureaucratic constraints imposed by state officials as a result of representing a public institution.

15. Reallocation of financial resources to meet changing needs.

16. Lack of interest by participants to implement management techniques and exercise budget control.

17. Lack of procedures to establish budget control at the purchase request level.

18. Measurement of effectiveness of programs and allocations.

19. Uncertainty of yearly funding levels.

20. Evaluation of departmental results and productivity in support of institutional goals.

## IV. RECOMMENDATIONS

The recommendations derived as a result of the findings consist of guidelines for the establishment, utilization, and assessment of financial management systems as well as suggestions for further study.

The following guidelines are provided to assist administrators in public higher education institutions considering adoption or modification of a financial management system for budget control and resource allocation:

1. The individual charged with the responsibility of fiscal management must implement a task force consisting of those administrators from the university and state who are directly accountable for budget control and resource allocation. This group must be allowed ample time and resources for executing an extensive study of various financial management systems utilized in other institutions.

2. Any specific financial management system must be adopted by a college or university only after all

alternatives have been fully explored and the advantages and disadvantages of the approach have been identified. The designated system should have been totally evaluated with respect to institutional objectives, available facilities and personnel needed to maintain the procedure, and estimated cost for implementation.

3. Actual application of any financial management system must be preceded by training of all involved participants. Once the system has been put into effect, periodic sessions with engaged administrators must be organized in order to facilitate understanding and cooperation.

4. Regular periodic evaluation of the financial management system must be established so as to ensure its effectiveness. To facilitate communication concerning fiscal matters, the institution should publish and disseminate data pertaining to financial status and management.

Additional studies need to elucidate the following areas:

1. Factors dealing with the specific financial management systems enumerated in this study. This research should contain advantages and disadvantages of each approach as well as explanations by university administrators of why their respective procedure was chosen.

2. Methods of alleviating difficulties specified by participants in this study.

3. Factors which state officials consider to be prominent in the success or failure of financial management systems in state universities.

4. The extent of involvement of all participants in the planning, implementation, and evaluation of the utilized financial management system in their institution. This research should be conducted on a state-wide basis.

5. Plans for systematizing the participation of faculty, students, administrators, and state officials in the planning, implementation, and evaluation of a specific financial management system.

6. Utilization patterns of financial management systems with respect to state accrediting regions and size of institutions.

7. Long-range effects of particular financial management systems. This research should include the impact on participants, departments, and academic programs.

8. Research similar to this study conducted regularly (at least every five years) in order to ascertain the current financial management systems in use.

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# APPENDICES

# APPENDIX A

# QUESTIONNAIRE

QUESTIONNAIRE

Institutional Code Number_____

The following questionnaire relating to resource management is designed to identify how your institution is using and managing its fiscal budget control and resource allocation procedures. Responses to this instrument will remain in strictest confidence.

1. Please check the following categories that best describe your institution.

   A. Size of Institution:

   ___a. 1-2,500 ___e. 20,001-30,000

   ___b. 2,501-5,000 ___f. 30,001-40,000

   ___c. 5,001-10,000 ___g. 40,001-50,000

   ___d. 10,001-20,000 ___h. 50,000+

   B. Accreditation region:

   ___a. MSA/CHE ___d. NASC

   ___b. NEASC ___e. SACS-Commission on Colleges

   ___c. NCA ___f. WASC-Sr.

2. Is there a formal system for budgetary control and allocation of resources within your institution?

   ___ Yes ___ Unsure ___ No

   If yes, please complete the entire questionnaire.

   If no, please state briefly the reasons why no such

system is in use and if your institution has current plans for adopting any such system._____

_____

3. In the left column identify only one primary system utilized by your institution for budget control and resource allocation. In the right column rate the system identified in the left column on an eight-point scale where "1" represents ineffective and "8" represents a superior system.

| | System | Rating |
|---|---|---|
| ____a. | Program planning and budget system (PPBS)..... | _____ |
| ____b. | Zero-base budgeting (ZBB)..... | _____ |
| ____c. | Cost/benefit analysis..... | _____ |
| ____d. | Cost-effectiveness analysis..... | _____ |
| ____e. | Incremental budgeting..... | _____ |
| ____f. | Formula budgeting..... | _____ |
| ____g. | Performance budgeting..... | _____ |
| ____h. | Function-object budgeting..... | _____ |
| ____i. | Unit budgeting..... | _____ |
| ____j. | Program evaluation and review technique (PERT)..... | _____ |
| ____k. | Critical path method (CPM)..... | _____ |
| ____l. | Simulation..... | _____ |

____m. Management by objectives (MBO)..... _____

____n. Delphi..... _____

____o. Management information system (MIS)..... _____

____p. Other (Please specify.)_____

_____

4. In the left column identify as many systems as your institution uses for a secondary approach to budget control and resource allocation. In the right column rate each system identified in the left column on an eight-point scale where "1" represents ineffective and "8" represents a superior system.

| | System | Rating |
|---|---|---|
| ____a. | Program planning and budget system (PPBS). | _____ |
| ____b. | Zero-base budgeting (ZBB)..... | _____ |
| ____c. | Cost-benefit analysis..... | _____ |
| ____d. | Cost-effectiveness analysis..... | _____ |
| ____e. | Incremental budgeting..... | _____ |
| ____f. | Formula budgeting..... | _____ |
| ____g. | Performance budgeting..... | _____ |
| ____h. | Function-object budgeting..... | _____ |
| ____i. | Unit budgeting..... | _____ |
| ____j. | Program evaluation and review technique (PERT)..... | _____ |
| ____k. | Critical path method (CPM)..... | _____ |
| ____l. | Simulation..... | _____ |

____m. Management by objectives (MBO)..... _____

____n. Delphi..... _____

____o. Management information system (MIS)..... _____

____p. No secondary system is used.

____q. Other (Please specify.)_____ _____

_____

5. Who was responsible for developing this primary management system? (Check only one.)

____a. President

____b. Business and Financial Administrator

____c. Trustee

____d. Students

____e. Outside consultant

____f. Professional negotiator

____g. Other (Please Specify)_____

_____

6. Does this primary system provide continued improvement in resource management? ___ Yes ___ Unsure ___ No

7. Does this primary system provide continued improvement in budgetary management? ___ Yes ___ Unsure ___ No

8. Does this primary system include a specific long-range plan for purposes of financial management?

___ Yes ___ Unsure ___ No

If yes, please specify. _____

_____

9. Have financial requirements been analyzed for every department? ___ Yes ___ Unsure ___ No

10. Have financial requirements been analyzed for every academic program? ___ Yes ___ Unsure ___ No

11. Is there a policy within the primary system for generating communication in your department?

___ Yes ___ Unsure ___ No

If yes, please specify._____

_____

12. Is there a policy for coordinating communication between the financial department and other sectors within the institution? ___ Yes ___ Unsure ___ No

If yes, please specify._____

_____

13. Is there a policy designed to provide feedback from the financial department to the external community?

___ Yes ___ Unsure ___ No

If yes, please specify._____

_____

14. Does this primary system utilize a reporting procedure which provides financial administrators with necessary data for making decisions? ___ Yes ___ Unsure ___ No

If yes, please specify._____

_____

15. Does the amount and kind of feedback provide financial administrators with sufficient information to assess the effectiveness with which funds are being used?

___ Yes ___ Unsure ___ No

16. Does this primary system provide adequate fiscal statements to the administrator? ___ Yes ___ Unsure ___ No

17. Is there a technique for evaluating the performance of this primary financial management system?

___ Yes ___ Unsure ___ No

If yes, please specify._____

_____

18. Are current audits positive about your financial management? ___ Yes ___ Unsure ___ No

19. How would you characterize the overall effectiveness of the primary financial management system?

___ Very satisfactory ___ Satisfactory

___ Unsatisfactory ___ Very unsatisfactory

20. In general, how would you characterize the level of involvement in the primary financial management system utilized in your institution?

___ Democratic ___ Autocratic ___ Laissez-faire

___ Team approach ___ Other (Please specify.)_____

_____

21. Please estimate the initial cost of implementing this primary management system in your institution.

_____

22. Has the cost of implementing the management system been justified with respect to improved effectiveness?

___ Yes ___ Unsure ___ No

23. Please identify major difficulties which you have experienced in the management of financial resources.

_____

_____

Title of person answering questionnaire_____

Please present any comments you would like to make about your financial management system or this study.

_____ Check here if you wish a summary of the results.

Thank you for your cooperation and assistance.

# APPENDIX B

# COVER-LETTER

COVER-LETTER

THE UNIVERSITY OF TENNESSEE

Knoxville, Tennessee 37916

8063 Cheshire Lane
Chattanooga, TN 37421

Dear Financial Administrator:

As a doctoral student in the College of Education at The University of Tennessee, I am conducting a study to ascertain the management systems utilized in budget control and resource allocation in higher education. My goal is to identify which procedures are currently in use and which are perceived as being effective.

Your institution was selected randomly and is one of only 216 chosen throughout the United States to participate in this study; hence, your response is needed in order to increase the validity of the results. Responses to the enclosed questionnaire are needed in two weeks and will be kept in complete confidence. The institutional code number on the instrument is solely for control purposes and will be used to follow up on nonparticipants.

At the completion of the study, a summary of the results will be provided to those respondents who express such a desire. This information may prove valuable to you as an administrator of finances in formulating future decisions concerning budget control and resource allocation.

Thank you for your cooperation in responding to this inquiry. The questionnaire is printed on a self-addressed stamped folder for your convenience. Return of this questionnaire constitutes informed consent to participate. Any materials related to your financial management system which you would like to forward will be appreciated.

Sincerely,

Betty Cox

Enclosure

# APPENDIX C

# POSTCARD REMINDER

POSTCARD REMINDER

PLEASE HELP!

Approximately two weeks ago you should have received a questionnaire related to budget control and resource allocation. In order to complete my research I am again requesting that you or a member of your staff respond to the instrument as soon as possible.

Thank you for your assistance in this matter.

Betty Cox
8063 Cheshire Lane
Chattanooga, TN 37421

# APPENDIX D

## SECOND COVER-LETTER

SECOND COVER-LETTER

THE UNIVERSITY OF TENNESSEE

Knoxville, Tennessee 37916

8063 Cheshire Lane
Chattanooga, TN 37421

Dear Financial Administrator:

In order to attain the maximum level of response and increase the degree of validity, I am sending this reminder that I have not received your completed questionnaire pertaining to budget control and resource allocation. I am quickly nearing the projected deadline of the study and need your assistance for its completion.

Since the original research instrument was sent you four weeks ago and may have been misplaced, I am enclosing another inquiry. It would be greatly appreciated if you or a member of your staff would respond.

Thank you for your cooperation.

Sincerely,

Betty Cox

Enclosure

# APPENDIX E

# LIST OF VARIABLES

LIST OF VARIABLES

| VARIABLE | FACTOR |
|---|---|
| 1 | Size of institution |
| 2 | Accreditation region |
| 3 | Existence of a formal system for budgetary control and allocation of resources in institution |
| 4 | Management systems designated as primary |
| 5 | Effectiveness rating of PPBS as primary system |
| 6 | Effectiveness rating of ZBB as primary system |
| 7 | Effectiveness rating of cost/ benefit analysis as primary system |
| 8 | Effectiveness rating of cost-effectiveness analysis as primary system |
| 9 | Effectiveness rating of incremental budgeting as primary system |
| 10 | Effectiveness rating of formula budgeting as primary system |
| 11 | Effectiveness rating of performance budgeting as primary system |
| 12 | Effectiveness rating of function-object budgeting as primary system |

| VARIABLE | FACTOR |
|---|---|
| 13 | Effectiveness rating of unit budgeting as primary system |
| 14 | Effectiveness rating of PERT as primary system |
| 15 | Effectiveness rating of CPM as primary system |
| 16 | Effectiveness rating of simulation as primary system |
| 17 | Effectiveness rating of MBO as primary system |
| 18 | Effectiveness rating of Delphi as primary system |
| 19 | Effectiveness rating of MIS as primary system |
| 20 | PPBS designated as secondary system |
| 21 | Effectiveness rating of PPBS as secondary system |
| 22 | ZBB designated as secondary system |
| 23 | Effectiveness rating of ZBB as secondary system |
| 24 | Cost/benefit analysis designated as secondary system |
| 25 | Effectiveness rating of cost/ benefit analysis as secondary system |
| 26 | Cost-effectiveness analysis designated as secondary system |
| 27 | Effectiveness rating of cost-effectiveness analysis as secondary system |

| VARIABLE | FACTOR |
|---|---|
| 28 | Incremental budgeting designated as secondary system |
| 29 | Effectiveness rating of incremental budgeting as secondary system |
| 30 | Formula budgeting designated as secondary system |
| 31 | Effectiveness rating of formula budgeting as secondary system |
| 32 | Performance budgeting designated as secondary system |
| 33 | Effectiveness rating of performance budgeting as secondary system |
| 34 | Function-object budgeting designated as secondary system |
| 35 | Effectiveness rating of function-object budgeting as secondary system |
| 36 | Unit budgeting designated as secondary system |
| 37 | Effectiveness rating of unit budgeting as secondary system |
| 38 | PERT designated as secondary system |
| 39 | Effectiveness rating of PERT as secondary system |
| 40 | CPM designated as secondary system |
| 41 | Effectiveness rating of CPM as secondary system |
| 42 | Simulation designated as secondary system |

| VARIABLE | FACTOR |
|---|---|
| 43 | Effectiveness rating of simulation as secondary system |
| 44 | MBO designated as secondary system |
| 45 | Effectiveness rating of MBO as secondary system |
| 46 | Delphi designated as secondary system |
| 47 | Effectiveness rating of Delphi as secondary system |
| 48 | MIS designated as secondary system |
| 49 | Effectiveness rating of MIS as secondary system |
| 50 | Person responsible for development of primary system |
| 51 | Provision of continued improvement in resource management |
| 52 | Provision of continued improvement in budgetary management |
| 53 | Provision of long-range plan for financial management |
| 54 | Analysis of financial requirements for every department |
| 55 | Analysis of financial requirements for every academic program |
| 56 | Provision of policy for generating communication in financial department |

| VARIABLE | FACTOR |
|---|---|
| 57 | Provision of policy for coordinating communication between financial department and other institutional sectors |
| 58 | Provision of policy to provide feedback from financial department to external community |
| 59 | Provision of reporting procedure to give financial administrator the necessary data |
| 60 | Provision of sufficient information to assess effectiveness with which funds are being used |
| 61 | Provision of adequate fiscal statements to the administrator |
| 62 | Provision of technique for evaluating performance of primary system |
| 63 | Whether current audits are positive about utilized financial management |
| 64 | Overall effectiveness of primary system |
| 65 | Level of involvement in primary system |
| 66 | Estimate of initial implementation cost of primary system |
| 67 | Whether implementation cost has been justified with respect to improved effectiveness |

# VITA

Betty Ann Cox, daughter of Lillian B. and Wallace E. Hardison, was born on September 15, 1951 in Chattanooga, Tennessee. Her public education was obtained in Hamilton County where she graduated from Central High School in 1969.

She entered The University of Tennessee at Chattanooga in the fall of 1969 and received a Bachelor of Science in Elementary Education in 1973. Immediately upon graduation she entered the UTC graduate program and was awarded the Master of Education in August 1974. During this time, Mrs. Cox was given an academic scholarship and inducted into numerous honor organizations including Mortar Board, Alpha Society, Kappa Chi Epsilon, and Alpha Delta Kappa.

In 1973 she was employed by the Hamilton County School System as a teacher at Spring Creek Elementary School where she instructed fourth and fifth grades for seven years.

Mrs. Cox entered the graduate school at The University of Tennessee at Knoxville in June 1979 and received the Doctor of Education Degree in Educational Administration and Supervision in June 1982. She completed this program with collateral areas in Statistics and Higher

Education. While finishing her doctoral studies, she served as supervisor of student teachers and an English instructor for The University of Tennessee at Chattanooga.

She is married to Stanley Joe Cox of Chattanooga, Tennessee and has two daughters, Stephanie Milicent Cox and Allison Whitney Cox.